

May 1986

The Naval Aviation Safety Review

V-31 #11 U.S. Navy

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MORGAN
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Naval Aviation



A Winning Team

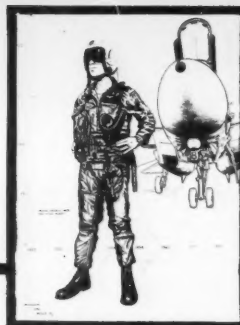


Four special Naval Aviators, Secretary of the Navy John Lehman, VAdm. Ed Martin, Capt. Ted Wilbur, USNR (Ret.) and Vice President George Bush, kick off the observance of the 75th anniversary of Naval Aviation in ceremonies at the National Air and Space Museum. The Vice President's World War II experiences were commemorated in a specially-commissioned oil painting by noted aviation artist and former Approach staff member Capt. Ted Wilbur, USNR (Ret.). Commissioned by Hearst Publications, the painting depicts then-Ltjg. Bush at the controls of his TBM Avenger torpedo bomber. As a member of squadron VT 51 and at the tender age of 18, Ltjg. Bush was the youngest naval aviator at the time. He flew 58 combat missions and was shot down once. He ditched and was rescued by the U.S. submarine *Finback* on area patrol. For his conduct during this mission, particularly after the ditching of his plane, Mr. Bush was awarded the Distinguished Flying Cross.

Recalling his days as a naval aviator, Vice President Bush referred to Naval Aviation as "one of the greatest fighting forces in the world."

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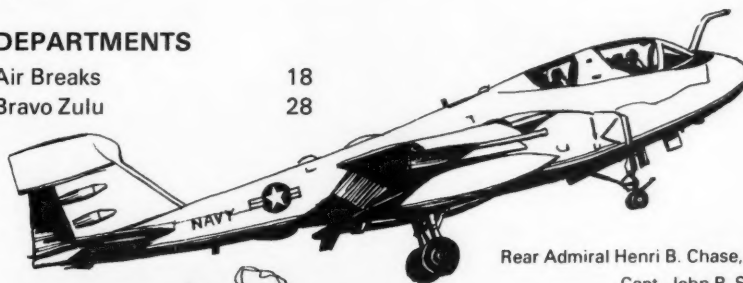
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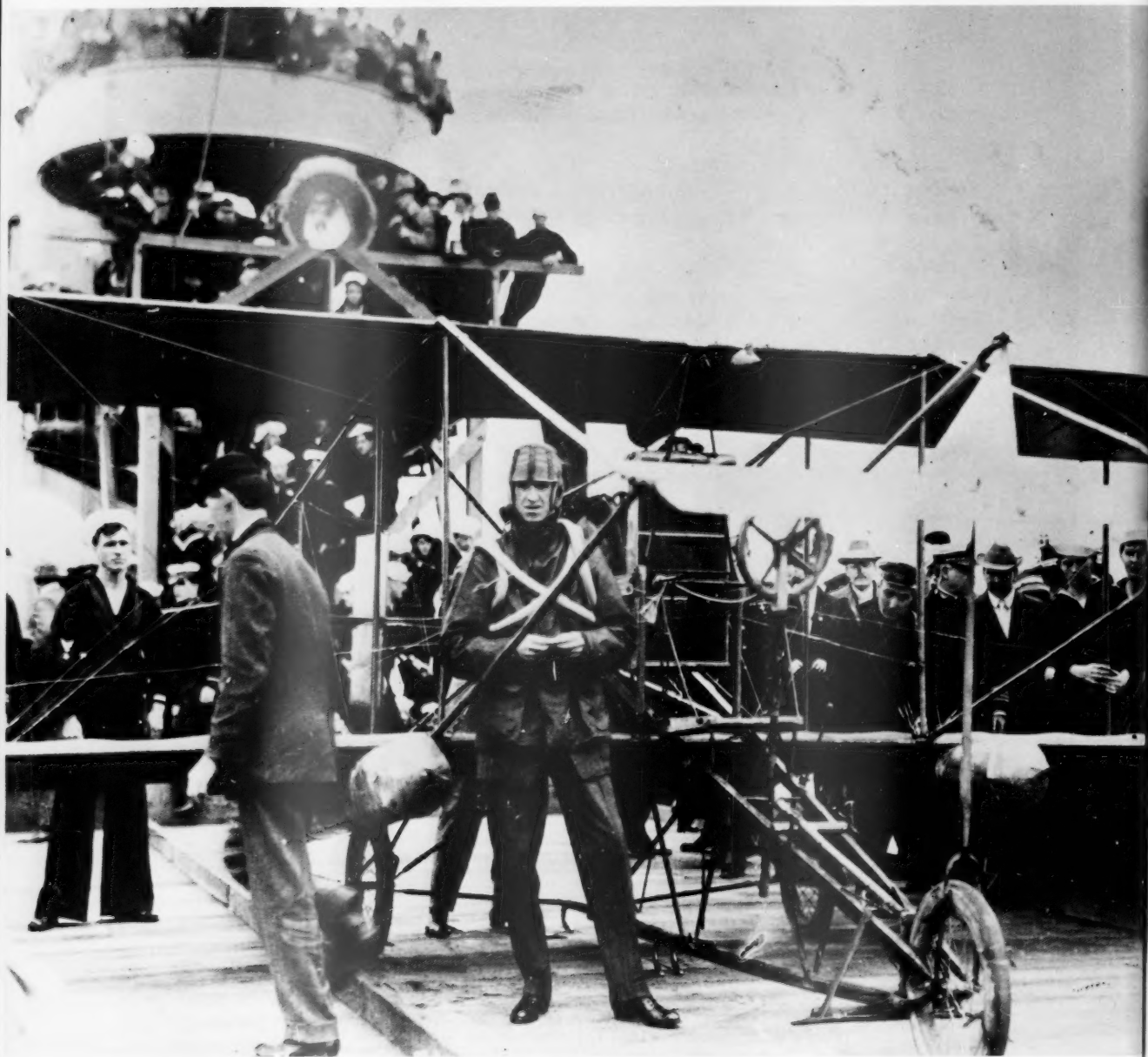
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The author wishes to thank Capt. Eric Brown, RN, Mr. Norman Polmar and Mr. Bob Lawson for supplying several of the historical photographs used in this article.

Naval Aviation Safety

By Peter Mersky

In the Beginning



Pioneer aviator Eugene B. Ely models the latest in flight gear after landing aboard USS *Pennsylvania* on January 18, 1911, the first shipboard landing of an aircraft. He took off an hour later to return to San Francisco.



A Sopwith 1 1/2-Strutter leaves the catapult over a cruiser's guns in the early '20s.

THE earliest naval aviation mishap recorded at the Naval Safety Center involves a Curtiss HS-3L Flying Boat. It happened on January 2, 1920, and the aircraft suffered damage only to the "keel fittings." There were no injuries. A second mishap, on the same day, involved a JN-6, a Curtiss Jenny trainer.

Indeed, the first week of 1920 appears to have had its share of problems. There were several other fixed-wing aircraft accidents, as well as one involving a dirigible on January 13. On January 29, a war surplus Sopwith One-and-a-half Strutter (you've got to be a real aviation buff to know some of these ancients) crashed after launching from the USS *Pennsylvania*.

The now-familiar phrase "pilot error" first appears in the account of a mishap on August 20, 1920, when a DH-4B rolled off the field into the mud and flipped over. The 1920s had their share of documented mishaps, due to such causes as "fuel supervision," "flight planning," "maintenance error," "technique" and, of course, "judgment." There were always questions and disagreements. Why, even in the decade preceding, no less a luminary than 1st Lt. Alfred A. Cunningham, Marine Corps Aviator No. 1, wrote Washington of his concerns.

Continued

"Capt. W. I. Chambers, U.S. Navy
Navy Department
Washington, D.C.

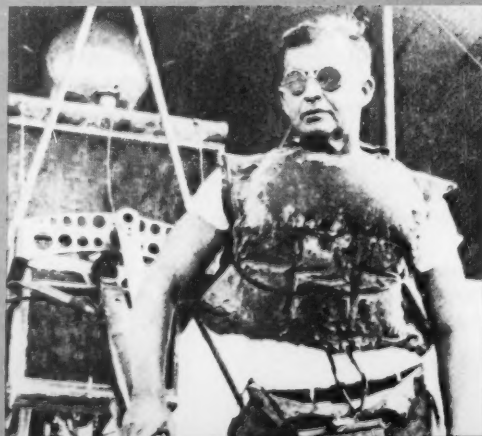
My Dear Capt. Chambers:

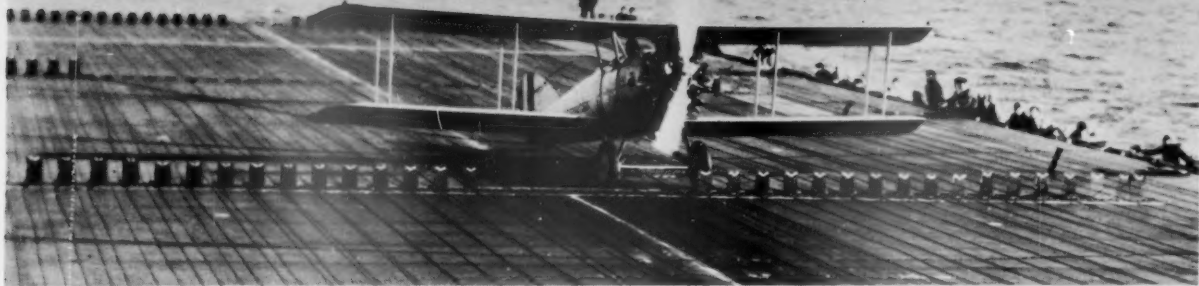
Lt. Smith and Ens. Chevalier made a flight in the flying boat, with one of the new OX motors, to Old Point Comfort, Va., on the 22nd. In starting back they disabled the machine and wired for spare parts. No details of the accident have been received, but they asked for a complete lower wing and flippers. These were sent to them by express. A message was received today saying that the weather was too bad to start back.

My machine, as I told you and as Mr. Towers probably told you, is not in my opinion fit for use. I built it from parts of the Burgess F and the Wright B, which are not exactly alike and nothing fitted. I had to cut off and patch up parts and bore additional holes in beams in order to make them fit. The engine bed, made by Burgess, was not exactly square with the front beam, so the engine had to be mounted a little out of true (with reference to the engine bed). I have made over 200 flights in this machine and recently, in spite of unusual care of myself and men, something seems to vibrate loose or off on a majority of the flights made. One of the propeller shafts is the same one used with the Gyro motor in the old machine. It is the only left-handed shaft here.

While the engine runs smoothly, it does not deliver nearly as much power as when it was newer, and even then, it did not have enough power to fly safely in any but smooth weather. It is impossible to climb over a few hundred feet with a passenger. The whole machine has just about served its usefulness and I would like very much to have a new machine of the single-propeller type. Lt. Arnold, of the Army, after seeing the machine run and examining it, said that none of the Army flyers would go up in it. Will you kindly let me know what the prospects are for my getting a new machine.

Respectfully,
Alfred A. Cunningham
Naval Aviation Camp,
Annapolis, Md.
July 25, 1913"





LCdr. G. deC. Chevalier brings his Aeromarine aboard for the first landing on the first U.S. carrier, the *Langley* (CV 1). Note the primitive "fiddle bridge" arresting gear.

— reciprocated with the first landing on the *Langley* on October 26. His aircraft was an Aeromarine.

By the time de Chevalier made his landing, there had been a lot of trial and error concerning the landing of aircraft on a deck. The British had devised a system of cables oriented fore and aft, and raised 9 inches above the deck. The landing aircraft was equipped with hooks on the landing gear. The hooks would run against the cables and the resulting friction was supposed to bring the plane to a halt. It seldom worked satisfactorily.

The U.S. Navy tried the British system but wisely discarded it. Lt. Alfred M. Pride (later Admiral) designed a system with the wires oriented beam wise, using weights. The landing aircraft would catch the wire and as the wire was pulled out, the weights would eventually halt the plane's forward motion. Lt. Pride tried his design on August 11, 1921, and the design worked well enough for it to be incorporated into the *Langley*. The ship made a cruise in 1923 along the East Coast to show off the new carrier and its aircraft to the public. It must be said that the citizens were probably more impressed with the possibility of watching a crash as the little biplanes left the deck only to dip toward the water before their pilots brought them up to safe, level flight.

Carl Norden gave the final input for the arresting gear, the essential design of which remains to the present day. Norden, who was to have his name forever linked with the famous bombsight of World War II, developed a series of winches that held the wires above the deck and also operated a Waterbury speed gear, actually a pump, which applied pressure on the winch and eventually stopped the aircraft. The wire was repositioned by an electric motor.

Lt. Pride did not like the idea of the electric motor since he knew that if the ship suddenly lost power, the arresting gear would be inoperative. Aircraft in the air would be placed in a



A Martin T4M-1 torpedo bomber overflies the *Saratoga* in preparation for landing. T4Ms served for several years, from the late '20s to the early '30s, just over 100 being constructed.

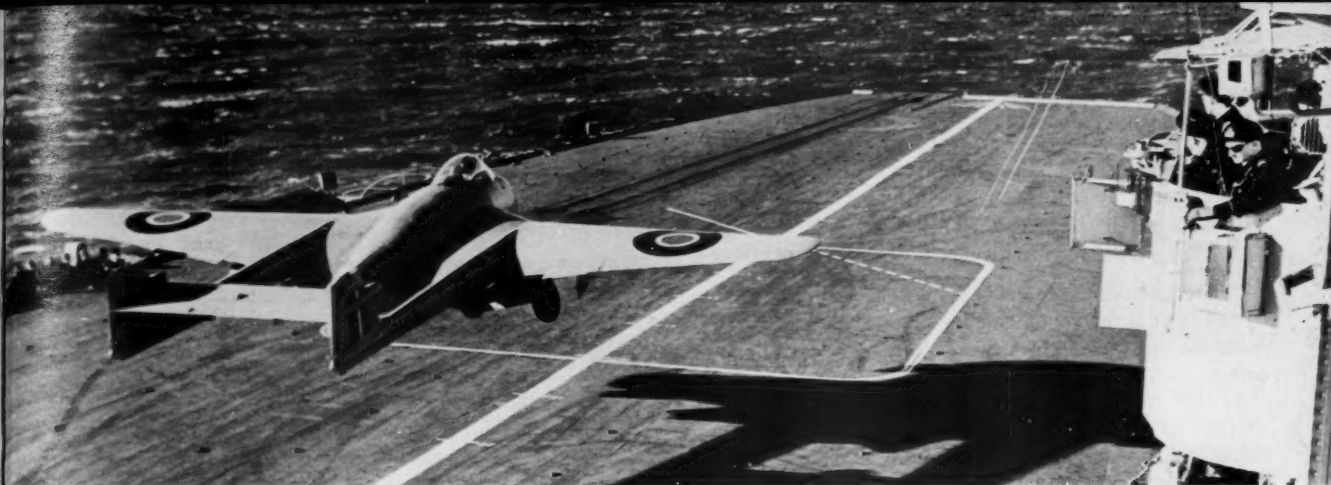
For you trivia buffs, the question of when the first carrier operations occurred, and who made the first landing and takeoff, is not as simple as it would first appear. Sure, Eugene Ely made the first takeoff and landing from a *ship*, in 1910 and 1911 respectively, but the ships involved were not aircraft carriers. Even the British, who actually conducted the first aerial strikes by ship-based aircraft during the First World War, launched their planes from vessels with flight decks attached to the ship's main structure.

The first honest-to-goodness takeoff from a bona fide commissioned aircraft carrier came on October 17, 1922, when Lt. V.C. Griffin launched from the USS *Langley*, (CV 1), in his single-seat Vought VE-7SF. The carrier was at anchor in the York River.

LCdr. G. de C. Chevalier — his name was actually Godfrey de Courcelles Chevalier, but everyone called him "Chevvy"

The early British carrier HMS *Furious* with a split flight deck launched the first carrier raids in 1918.





LCdr. Eric Brown makes the first jet takeoff from a carrier in a De Havilland Vampire in December 1945.

hazardous, if not disastrous, situation. Therefore he designed a hydraulic gear, and the arresting system was eventually placed in both the *Lexington* (CV 2) and the *Saratoga* (CV 3).

There remained one piece of the carrier landing puzzle to be developed: the LSO. Even though the aircraft carrier was a reality by the early '20s, the following period was understandably one of experimentation and development. By December 1927, when the *Lexington* was commissioned, deck lightings for night flying had been developed, although the system was far from satisfactory.

The captain of the *Langley*, pioneer naval aviator Cdr. Kenneth Whiting, who is credited with almost single-handedly persuading the Navy to develop the *Langley* as the first carrier, was watching flight operations while his ship was anchored in the York River. At that time, the pilots were being left entirely to their own skills to negotiate safe landings. Whiting became concerned as he watched the approach of a young aviator who was attempting his first landing on a ship. The pilot made several approaches, but just at the point when he should chop power and land, he seemed to lose his nerve; his engine would roar and he would go around.

Frustrated, Whiting jumped onto the deck, borrowing the white hats from two sailors observing the display, and through a series of exaggerated signals, the skipper coached the aircraft to a safe landing. Everyone was impressed with the idea of someone outside the aircraft monitoring the approach with signalled suggestions, and the Landing Signal Officer was born.

Today, jet operations aboard carriers are commonplace. As we enter the last 25 years of the first century of naval aviation, it's hard to think of a time when the whistling roar of the jet wasn't heard on the flight deck. But 40 years ago, the jet turbine-powered aircraft was a new development. Although the Germans and the British had put the type into combat by the last year of World War II, the U.S. lagged far behind. With the massive Allied victory, the German effort was stillborn. But the British made considerable use of their infant jet industry, as well as taking advantage of German technology made available after the surrender.



LCdr. Jim Davidson accomplishes the first U.S. takeoff from a carrier in July 1946. His aircraft is a McDonnell FH-1 Phantom.

The first operational British jet fighter was the Gloster Meteor, a fairly shapely, twin-engine aircraft which spent most of its wartime career chasing the V-1 "Buzz Bomb," a German pilotless bomb, over the English countryside. Other companies also had designs, the best of which came from De Havilland. This pioneer firm produced the D.H. 100 Vampire, a twin-boomed, single-engine fighter. On December 3, 1945, the little Vampire made aviation history when Royal Navy LCdr. Eric Brown made the first landing by a jet on an aircraft carrier, the *HMS Ocean*. (See the article by Capt. Brown on page 8. He is reckoned to be the master "trapper," with nearly 2,500 arrested landings.)

After initial practice on land, Brown flew his Vampire out to the carrier steaming off the Isle of Wight. Although the decision had been made to cancel the attempt due to bad weather, the captain of the *Ocean* knew LCdr. Brown from previous experience and decided to ignore the order. He turned his ship into the wind in preparation for landing operations. Brown later wrote about his experience in the British publication *Air International*:

"I cut the throttle and made no further adjustment to the elevators until the round-down was crossed at 82 knots. Then I pulled back the stick fairly sharply until

the aircraft stalled completely as indicated by the kick on the port aileron as the wing dropped. The rate of fall-off in thrust was so slow that, as I crossed the round-down, 6,000 rpm were still registering, so in an emergency the throttle could be opened up very quickly to raise the revs to the 10,000 required for a wave-off without exceeding jet pipe temperature limitations."

Of course, having accomplished the first jet landing, Brown turned right around and made the first jet takeoff. He later made the first landing by a twin-jet aircraft when he flew a Meteor onto the HMS *Implacable* in June 1948.

By 1948, the U.S. had accomplished initial development of its own jet fleet aboard carriers. In fact, LCdr. Brown's landing had only beaten the Americans by eight months. The little company of McDonnell had produced the Navy's first jet fighter, the XFD-1 Phantom in early 1945, and on July 21, 1946, LCdr. Jim Davidson made the first launch and recovery by a U.S. jet aboard the *Roosevelt* (CVB 42). The Phantom, re-designated FH-1, entered production and eventually equipped VF 17A at NAS Quonset Point, Rhode Island. VF 17A was thus the first operational jet squadron in the U.S. Navy.

However, the first operations by a U.S. Navy jet squadron aboard a carrier were carried out by VF-5A when it flew the tubby FJ-1 Fury out to the USS *Boxer* in March 1948. VF 17A CQ'd two months later in May. (Aviation history can get complicated.)

By the late '40s, the U.S. was in the forefront of carrier aircraft development, although three major changes were to come again from the UK. The developments included modifications to the flight deck, the catapult and the landing aids. Actually, the developments complemented one another. Since the aircraft carrier first went to sea, the flight deck had been oriented along the center line of the hull, fore and aft. Thus, launching and recovery operations had to be carefully planned. Aircraft on the deck had to be moved forward to clear the landing area aft of the island. And, if the barrier had to be used, there was the danger of the landing plane going through the webbing and crashing into the aircraft spotted forward. In 1950, the British originated the idea of a designated landing area, angled off the main deck. Eventually,

the "angled deck" was added to existing carriers and incorporated in those under construction. The new design allowed for simultaneous launching and recovery of aircraft as well as for additional catapults in the larger *Forrestal* class ships coming in the mid-50s.

Besides the angled deck, the smoother, more powerful steam catapults, also courtesy of Her Majesty's government, were put into service in the early '50s. The mirror landing system, originated by Royal Navy Cdr. H.N.C. Goodhart, also found its way onto U.S. carriers by 1955. Cdr. Bob Dose, CO of VX 3, flying an FJ-3 Fury, used the new landing aid to land aboard the USS *Bennington* (CVA 20) in August 1955.

It was also about this time that carriers were fitted with "hurricane bows," which fully enclosed the open area below the flight deck. This important modification gave the ships increased sea-keeping capabilities.

All these changes in the 1950s gave the aircraft carrier the shape she has today. True, the ships got bigger as their aircraft increased in size and capability, as well as expense, but with the production of the four ships of the *Forrestal* class — *Forrestal* (CVA 59), *Saratoga* (CVA 60), *Ranger* (CVA 61) and *Independence* (CVA 62), and the addition of the first nuclear-powered carrier, the *Enterprise* (CVAN 65), the aircraft carrier's major design characteristics had been put down by 1955.

One odd sidelight of the World War II period was the development of the hangar deck catapult. Picture climbing into your F-14 or A-7 on the hangar deck, starting up and following the director's signals onto the track. The plane hunches down as tension is taken and you run up the engines. The cat officer checks the rise and fall of the deck as you throw a crisp salute. He swings his hand and drops to the deck and off you go, shot into the blue — from the O1 level, screaming through the hangar bay doors. No way? Well, maybe not today, but during the war, this method of launch was considered, although it never developed beyond the experimental stage.

During the '30s, as aircraft carriers continued their development, the Navy looked for alternate means of launching planes. British and Japanese ships had so-called upper and lower flying-off decks, the lower deck being an extension of

A VF-15 Hellcat launches from a hangar deck catapult in February 1944 during stateside operations.





LCdr. Tom Amen receives congratulations for scoring the first U.S. Navy kill over another jet aircraft in November 1950.

the hangar deck. Thus, U.S. developers began experimenting with a similar arrangement in four carriers, *Yorktown*, *Enterprise*, *Wasp* and *Hornet*. Three of the ships had two hydraulic catapults installed; the *Yorktown* had only one. The first launch with a hydraulic cat was made from the *Yorktown* in November 1938 while the ship was tied to the pier in Norfolk.

While gaining moderate success, these hangar-deck cats demanded considerable development and their use was suspended after several shots from the *Enterprise* nearly ended in disaster. Apparently, aircraft using these cats experienced fishtailing immediately after clearing the hangar bay, and biplanes experienced a loss of lift by the upper wing.

The introduction of the monoplane and the coming of war put the hangar bay catapult on hold. However, the arrangement was used at least once in combat. The new *Yorktown* (CV 10) launched TBF Avengers of VT 5 from the hangar deck during operations against the Japanese-held island of Kwajalein in December 1943. The method was occasionally used during work-ups in the Caribbean, but by July 1945, hangar-deck cats had been removed from U.S. carriers, an interesting footnote in the development of the aircraft carrier.

Interested in additional trivia? Well, the first aerial victories by Navy carrier-based jets occurred during the first year of the Korean War, in 1950. The Navy was caught somewhat unprepared when the North Koreans crossed the 38th parallel early in the morning of June 25, 1950. The only carriers in the area were the USS *Valley Forge* (CV 45) and the British HMS *Triumph*. The "Happy Valley" and *Triumph* flew continuous sorties against the enemy throughout the summer until additional carriers joined them in early August.

On July 3, VF 51 in the *Valley Forge* shot down two prop-driven YAK-9 fighters, holdovers from the Second World War, for the first kills of the war.

One of the new arrivals in August was the USS *Philippine Sea* (CV 47) which included VF 111 and VF 112 in its air wing. Both squadrons flew the Grumman F9F-2 Panther, the Navy's first truly operational jet fighter. On November 9, the CO of VF 111, LCdr. Tom Amen, borrowed an aircraft from VF 112 and launched as part of an escort for a group of AD Skyraiders and F4U Corsairs that were going to hit various

bridges and power plants. Specifically tasked with flak suppression, Amen took his wingman down against the flak sites. They were jumped by Russian-built MIG-15s. The high-tailed MiGs flashed through the formation and LCdr. Amen hauled his Panther around to give chase. The MiGs were faster and it took a while for LCdr. Amen to get within gun range. Armed with armor-piercing and high-explosive 20mm shells for flak runs, LCdr. Amen's F9F poured fire into one of the MiGs until it finally nosed over in a dive, trailing smoke and crashed. Thus, LCdr. Amen's kill became the first victory over another jet by a U.S. Navy carrier-based jet.

Then there's the story of Ltjg. Tom Hudner. A member of VF 32 in the *Leyte*, (CV 32) flying F4U-4 Corsairs. Ltjg. Hudner and Ens. Jesse L. Brown, the Navy's first black aviator, were bracketed by flak during a mission on December 4, 1950. Ens. Brown crash-landed behind enemy lines. His aircraft began to burn and Ltjg. Hudner, circling above, could see he was having trouble extricating himself from the aircraft. Making a difficult decision, Ltjg. Hudner crashed his plane near Ens. Brown and rushed to his squadronmate's assistance. Ens. Brown was pinned in his cockpit and there was little Ltjg. Hudner could do. He frantically called for help on his own plane's radio, but Ens. Brown died in his plane before rescue helicopters arrived. Ltjg. Hudner was finally picked up and was awarded the Medal of Honor for his heroism.

In the 75 years of its official existence, U.S. Naval Aviation has compiled a long record of accomplishment in war and peace. While it cannot be said that the participants in these achievements always acted with safety uppermost in their minds, the overall result usually meant a safer environment for those who followed in their footsteps. The relatively free-wheeling nature of early experiments may seem loose by today's standards, but as the operation and communities got more complicated, the people involved came to realize the necessity of becoming more safety conscious.

The use of standardized procedures for all phases of operation, including specific aircraft types as well as areas such as carrier operations, led to the creation of the program known as NATOPS. The first Naval Air Training and Operating Procedures Standardization (NATOPS) manual was written for the HSS-1 helicopter and distributed in July 1961. This manual prescribed standard operation procedures and flight instructions for the HSS-1 (later H-34), and set the tone for the long series of NATOPS manuals to follow. In December, 1963 a further development saw the consolidation of flight and operating instructions in one book, the first being the manual for the Grumman F9F-8T (later TF-9J).

Now, of course, each new aircraft gets its own big blue book, and generations of aviators have been literally raised on the material each NATOPS manual contains. Other manuals address such topics as air refueling, instrument flight and LSO procedures.

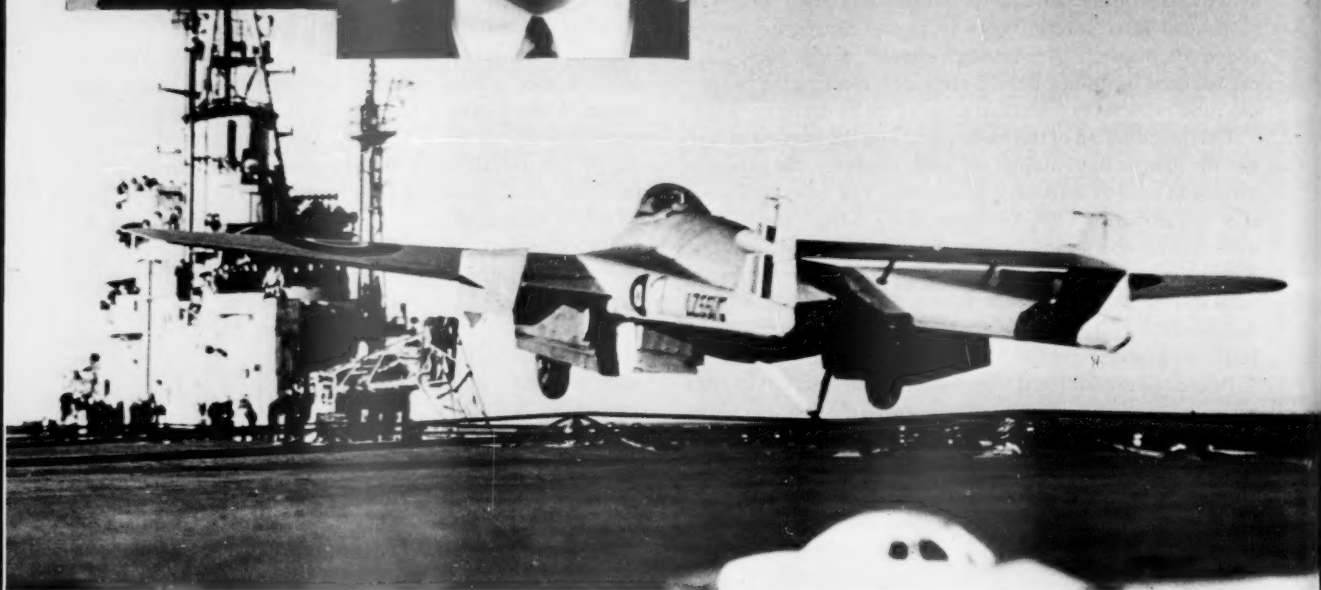
We are the grateful beneficiaries of all the experience and sacrifice of our predecessors in 75 years of naval aviation. Let's make every effort to stay around to take advantage of all they have to teach us. ◀

Peter Mersky is a writer for Approach. Widely published as an aviation writer, he has authored three books on the subject.



The Role of Flight Safety in My Flying Career

By Capt. E.M. Brown, Royal Navy



Upper left: Capt. Brown as commanding officer RNAS Lossiemouth, 1969;

Inset: the author during the heyday of his flight testing activities;

Lower: LCdr. Brown makes the first landing in a jet aboard an aircraft carrier, the HMS *Ocean* in December 1945.

HAVING accumulated more carrier landings, as well as having flown more types of aircraft than any other pilot in the world, I am frequently asked how I survived the climb up these statistical ladders.

I could give the easy answer and say that it was a little skill combined with a lot of luck, but that would be an oversimplification. In fact, although not gifted with a highly-developed sense of self-preservation, I was conscious that I was in a high-risk game. I knew I had better take steps to ensure that I stayed in the game and did not join the ranks of the "late lamented."

In the mid-1940s, I was chief naval test pilot for the Royal

Navy and commanding officer of aerodynamics flight at the Royal Aircraft Establishment, Farnborough. I flew many different types of aircraft, often 15 to 20 in a week. In World War II and the immediate postwar years, a work week was a full seven days. The variety and degrees of difficulty of the different types were compounded by the different countries of origin and the varying ways they designed cockpit instruments, fuel and oil systems, hydraulic, pneumatic and electrical systems, aircraft controls, operational controls and emergency systems.

To illustrate a few of the differences, the French aircraft throttles operated in the reverse direction to the British and American throttles. Thus to open a throttle in a French fighter of 1940, one *pulled* back, where a similar action in a British or U.S. aircraft would close the throttle. The American engine power was given in inches of mercury, while the British measurement was in pounds per square inch of boost, and the German's in *atas*. (atmospheres). Oil pressures could be in kilograms per square centimeters or pounds per square inch. Speeds were measured in kilometers per hour or miles per hour. Altitudes were feet or meters, and wheel brakes could be operated by foot or hand. Some aircraft had ejection seats, some reverse thrust, some braking parachutes, or combinations and permutations of all these.

Loss of an aircraft is a serious matter at any time, but loss of a prototype or research aircraft is a disaster with long-term repercussions. Perhaps it was this sense of responsibility that pricked my conscience. Whatever the incentive, I began to make my own flight safety precautions to suit the circumstances. By today's standards these may seem elementary, but in their own way, they were effective. Let me explain.

First, since most of the types I flew at Farnborough were either prototypes or had non-standard features, there were no approved Pilot's Notes, so briefings were on a pilot-to-pilot or find-out-for-yourself basis. I therefore devised an abbreviated format for quick reference in the air. The essentials such as single-engine safety speed, limiting indicated air speed in a dive, high Mach number characteristics, stall speeds, emergency drills and more were listed in a standardized format on a single kneepad card, together with any idiosyncrasies known for that aircraft type. This pad was clipped to my left leg and my test pad strapped firmly to my right leg. In the event of a bailout or ejection, the pad could be snapped off while the pad on my right knee with its valuable information was fixed.

To illustrate the diversification, here is an extract of two consecutive days of flying from my logbook in 1946.

De Havilland Sea Hornet — Single-Engine Deck Landing Assessment

Avro Lancaster II — Servo-Tab Controls Evaluation

Sikorsky R4B Hoverfly — Vortex Ring State Investigation

Messerschmitt Me. 163B — High Mach Number Dive Control Forces

Horten Ho. 1V — Rates of Roll Measurements

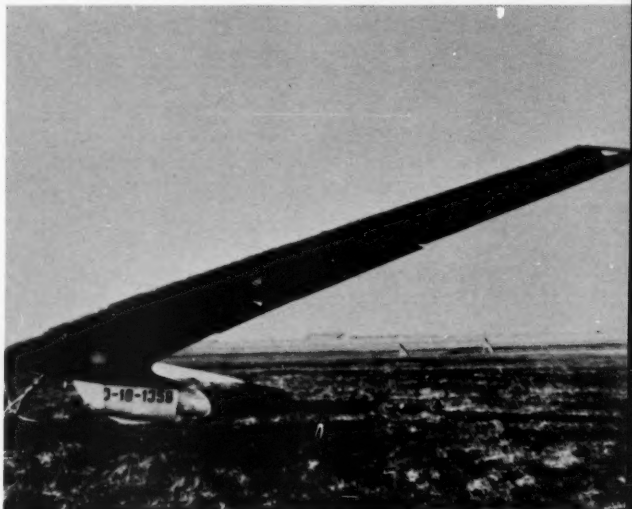
Supermarine Seafire IIC — Rocket High Catapult Launch



Avro Lancaster II



Supermarine Seafire IIC used for rocket high catapult launch tests.



Horten Ho. IV

The author landing a De Havilland Sea Hornet, one of the last twin-engined prop fighters to see service.



The Sea Hornet and Ho. IV were both prototypes, while the Lancaster II was a flying test bed for a new control system. The Hoverfly was the first operational helicopter from Sikorsky, and had been used in the late stages of the war, particularly in Burma in early SAR operations. The Me. 163, one of the more unusual aircraft to reach operational status during the war, was essentially a tailless, rocket-propelled interceptor. It flew against the huge U.S. day bomber formations from 1944 on. It was also considered by its German pilots to be the most dangerous aircraft to fly, mainly due to its highly volatile fuel which was known to explode on the ground with little provocation.

My second concession to flight safety was a do-it-yourself simulator that I rigged up at home. It was absolutely basic but allowed me to assess what stick force and rudder foot load limits I could handle. It also probably contributed to saving my life in the lethal de Havilland 108 Swallow, a tailless transonic research aircraft, when it entered an inverted spin during stall tests.

I knew from wind-tunnel tests that there was a probability of such an occurrence and was advised that disorientation often caused pilots to fail to recover from such a spin. I was able to suspend my home simulator cockpit upside down from a beam in the garden shed and get my wife to spin it around while I practiced the recovery drill, until I had it perfected.

My early days in deck-landing trials were more concerned with proofing new carriers than proofing new aircraft. With the pressure of war, the new ships for the Royal Navy were coming out of American and British shipyards at a furious pace, and their proliferation was matched by the scarcity of pilots. The Royal Navy was rather slow in getting locked on to LSOs in the professional sense, but was inclined to give the task to any pilot who was available for whatever reason. Since we were short of pilots, we were excruciatingly short of LSOs. I made a considerable number of my first 1,000 traps without an LSO or with the odd one press-ganged into that duty without any enthusiasm.

Since I had never met a professional LSO, I regarded the absence of an amateur LSO as a contribution to my flight safety, as there is enough room for error in landing on a carrier without one more human compounding it. Unfortunately, this phase of my flying life left me with a permanent distrust of LSOs which was only overcome when the mirror

appeared on the carriers.

The U.S. Navy had both the manpower and the determination to make the LSO system work effectively, using an advisory signalling system. The inevitable clash of religions came when cross-operating became a necessity, with the resultant crop of accidents. Both navies were given a sharp reminder that standardization is one of the basic precepts of flight safety.

The advent of jet aircraft into naval aviation really sharpened all our senses regarding flight safety. The quantum jump in speed, the absence of propeller lift control, and the fact that the pilot was seated very close to the accident, made a major reconsideration of carrier operations a necessity. I well recall the excitement when I brought the idea of the angled deck to the Naval Air Test Center, Patuxent, Md., in 1951 and demonstrated the steam catapult from the deck of HMS *Perseus*, tied up alongside a pier at the Philadelphia Navy Yard in February 1952. Then came the deck-landing mirror sight and the constant attitude rate of descent approach path, all Royal Navy ideas.

We also had another rather unusual idea to improve flight safety, by using a flexible rubber deck. A jet aircraft (divested of its landing gear) landed on the rubber deck with the aid of a single elevated arrester wire. It all worked beautifully but it withered as being rather too radical.

Since the 1950s, fixed-wing carrier aviation has relied heavily on development of angled decks, steam catapults, and mirror sights. However, we now have helicopters and vertical takeoff and landing (VTOL) aircraft and they have generated bright and practical ideas such as the bear trap and the ski-jump. Of course, the flight characteristics of these aircraft have, in themselves, contributed greatly to flight safety.

Although in the early 1940s scant attention was paid to flight safety, peacetime standards demand improved accident and casualty rates for both moral and economic reasons. In the 1980s, the economic factor is the driving force because the cost of modern military aircraft is astronomical, as is the cost of pilot training. The end result today is a world of simulators, flight seminars and flight safety officers.

Has the fun thus been taken out of flying? Many argue that this is so, but how can it be if you are given a better chance to live and enjoy the flying? In my mind, the great thing that flight safety has done for aviators is to increase their professionalism — and that can't be bad.

Capt. Brown enjoyed a rich and varied career as a Royal Navy Aviator. He accumulated nearly 2,500 arrested landings, which appears to be a world record. During combat operations in 1941, flying an American F4F Wildcat, known as the "Martlet" in British service, he shot down two German FW 200 Condor maritime bombers operating against the hard-pressed surface convoys. As noted in this article, Capt. Brown subsequently participated in many pioneering developments. He is currently a much sought-after lecturer.

Predict, Prepare and Prevent

By 1st Lt. B.L. Meuli, USMC

THINKING of situations that are "accidents waiting to happen" may be the first step toward avoiding mishaps. Even if we could predict losses, however, there are still a few ego-struck aviators that might argue the point. So, we work on being prepared. We don't always prepare too well and we don't always take the hints that are biting us in the leg, saying "Hey, maybe we should say NO!" Here are a few examples:

- You stay up late, and come to work for an 00-dark-30 brief, for which you're 15 minutes late. The operations duty officer was late too, so there isn't any coffee made. As usual, maintenance is prepared and the book gets signed off. As you're drinking your second cup of the now-hot coffee, you quickly read through the endless number of MAFs. It doesn't matter, however, because the first bird goes down on start-up. Your co-pilot preflights the second aircraft, while you read still another novel full of aircraft maintenance history.

It is getting so late now that you strap on the aircraft while the crew chief finishes closing up the top. Just as you are taxiing out of the chocks you remember the LPPs and cranials. The ODO calls the POC for the FRAG as you lift off the deck, only 50 minutes late. When you arrive at the pickup coordinates, which don't agree with your map, it is already too late for the ZIPPO brief. The Grunts load up. The crew chief begins locking the seats in place. Oh, well, we usually don't brief the crew chief anyway. As the Grunt Commander crawls up into the cockpit area to yell some instructions, while unfolding a gigantic map, you break the deck, raise the ramp and ask if everyone is strapped in. . . .

- It is 0430 and you're briefing aboard ship for a pre-dawn launch. Too early for breakfast, coffee and a roll will hold you for now. There is just enough time after the brief to find your aircraft and get ready. It is on Spot Two. You preflight as thoroughly as possible, but other aircraft begin to take off. Yours is the last aircraft left and there are 16 pax,



but only 14 LPPs. You did your load computation card and know there is room so you take them all. The winds are 20 knots; that's right at the limit for that quadrant. The others made it so. . .

- You've flown for five hours, and it seems as if you've been in the Delta pattern over the ship for at least five more. "They" call you with still another mission; externals this time. So you land, refuel, rig for externals and go for it. After all, you've been complaining about the lack of flight time. You get that mission done and guess what? . . . control has another. You'd like to get out of it but you know that there has to be an airborne SAR for missions at sea and no one else is around. You have the crew chief check the heads, then you start up and climb up to the Delta pattern to assume airborne SAR. You've already put in a 12-hour day when they ask you to rig for more externals. . . .

- It's Friday and you've been away from home for two weeks. Today is the last day. Ops has crammed an amazing amount of flying into the last 12 days and the last word that you ever want to hear is Marine Corps Combat Readiness Evaluation System (MCCRES). You're

flying the same bird that a junior HAC had to down yesterday. You've flown it too, so you're familiar with it. You pack up, check out, brief, preflight and decide to fly it even though the problem was not fixed. It was probably not a problem anyway. You know how these aircraft are after 12 days of constant flying. Besides you're in a section and it's time to go home. You've got the best crew chief around and you're only carrying a little cargo. It's VFR and forecasted to be clear all the way home. . . .

Most of us have either been in situations similar to these or can think of a half-dozen others.

So how can we prevent a mishap? By predicting them? Perhaps, but not too likely. We can preach safety, teach safety, and even study to be better prepared, but more than anything, we must live it full time. The best way to do that is with a healthy respect for your aircraft. Respect the possibility that any loss could have been you. We do a lot of predicting, even more preparing, but still mishaps occur.

We can't always predict them but we can never stop preparing. If we do, we'll never have a chance at preventing them.

Lt. Meuli is the NATOPS officer for HMM 163, and flies CH-46s.

Needed: A Bigger and Better Anymouse

By Cdr. Richard Shipman



ANYMOUSE is growing old, fat and non-productive. The Anymouse (anonymous reporting) column of Approach has been a fixture since the magazine began. It allows people to identify safety hazards in a way that would never have existed within the established Naval safety reporting system. But Anymouse has more than 30 years in, and is ready for retirement.

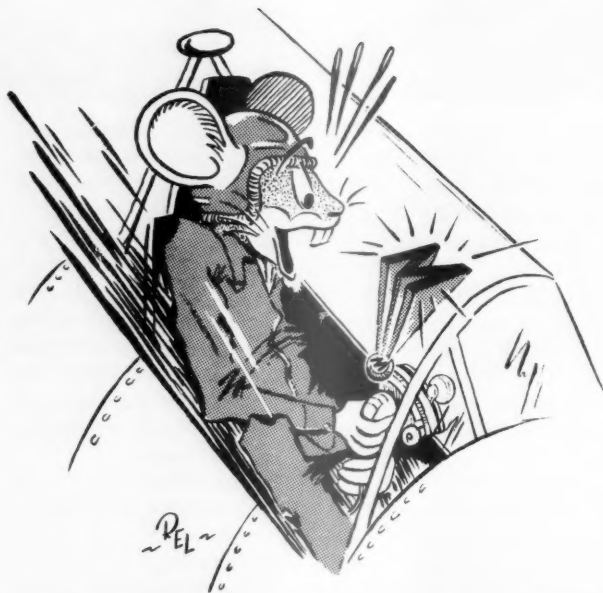
Since all contributions are submitted anonymously, the information sometimes tends to be of the "sour grapes" variety with little safety relevance. Feedback from the good information is limited to a few pages in Approach, and there is no cumulative data base. Neither is the system structured to provide follow-up on safety hazards identified. Finally, there is little official encouragement to submit these reports.

In contrast to the Navy's Anymouse program, the civilian aviation sector has established an informative and well-organized anonymous safety reporting system (ASRS) funded by the FAA and run by NASA. The ASRS has been in existence since 1976 and provides three important functions:

- Gathers candid information on safety hazards from the aviation grass roots: pilots, controllers, dispatchers, mechanics, etc.
- Provides information on safety hazards, gleaned from the reports, to agencies that may be able to take action — FAA, NTSB, specific airports, etc.
- Gives feedback to the aviation community through a monthly publication entitled "Callback" and through computer data established from ASRS reports.

The keynotes to the success of the civilian program are absolute anonymity and immunity from prosecution for the submitter. The reports are handled using security measures that are equivalent to secret. The only record of the identity of the submitter is destroyed shortly after the submission of the report. Immunity from license suspension is guaranteed by federal aviation regulations, provided certain provisions are met.

The safety benefits of an anonymous safety reporting system are immense. Without having to worry about prosecution or personal identification, pilots and controllers are free to "tell it like it is" and "fess up" on errors or shortcomings in their performance. This type of real-life human factors infor-



Artist Richard Lyon's version of Anymouse (c. 1953) when he made his debut in The Naval Aviation Safety Review, forerunner of Approach.

Through
the Years
with
Good ol'
Anymouse ...



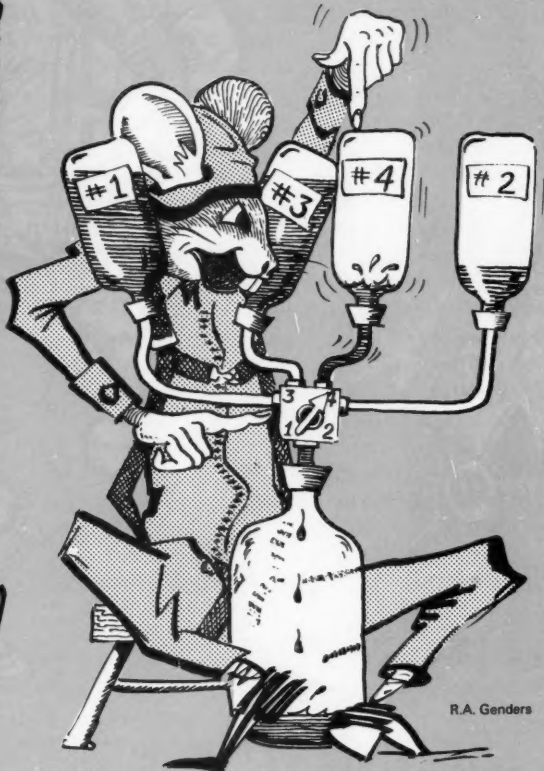
R.A. Genders

INTRODUCING...

AND THERE I
WAS, AT 50,000



Ted Wilbur's version of Anymouse (c. 1956).



R.A. Genders

R.A. Genders

INTRODUCING...

AND THERE I WAS, AT 50,000 FEET, AND...

ANYMOUSE

AND HIS

HAIRY TALES



ARE YOU AN ANYMOUSE?

[illegible]

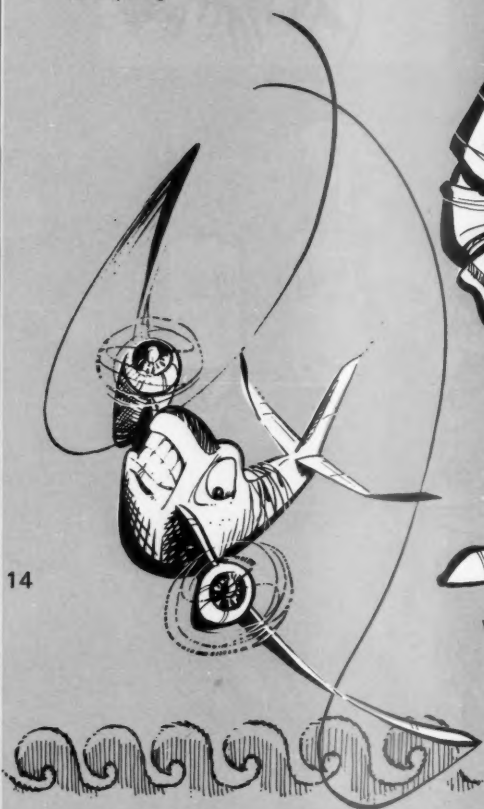
When the drawing of Anymouse was taken over by R.A. Genders (c. 1955) he was pictured as a capricious fellow capable of doing everything from screwing fuel exchanges to building a box for Anymouse forms.



R.A. Genders

"Now bring on that Tomcat!"

In 1962 Anymouse took the form of bugeyed aircraft to become the perfect blend of mouse and machine. Artist William Langston's version (c. 1972) was a gutty, aggressive fellow ready for anything.



14

William Langston



William Langston



Jack LaBar

Artist Jack LaBar pictured Anymouse (c. 1983) as an always young but helpful fellow involved in everything.



Jack LaBar



Jack LaBar

mation is almost impossible to obtain through traditional methods such as mishap investigations. And since human performance is the most common cause of aircraft mishaps, this is the kind of information that is most useful in any accident prevention program.

The Navy, through the Naval Safety Center and its safety publications department, is well-suited to establish an improved anonymous reporting system — hereafter referred to as the NAASREP (Naval Aviation Anymouse Safety Reporting Program). Details of the program could be laid down in OPNAVINST 3750.6 with a concurrent written guarantee of immunity from prosecution leading from submission of the report. As with the ASRS program, immunity would not be granted for reports of aircraft accidents, deliberate misconduct or criminal offenses. The system would in no way supercede any existing reporting requirements. Instead, the program would tap a resource that is generally unavailable now: insights into individual errors which probably didn't lead to an accident but could very well in the future.

All reports would be submitted to the editor of Approach magazine. The submitter would need to identify himself on the report for two reasons. First, to avoid the sour grapes "my boss is a loser" type of submission that is really not productive. Second, identification is necessary to gain additional information, if necessary. After a maximum of 10 days, the originator's identification would be removed and destroyed with no further method of recall available. The report would be sanitized and entered into the computer bank for future reference. Those reports that provide good safety information would be sanitized and published in Approach magazine. Follow-up action on anonymous submissions would often be necessary. Reports that appear to warrant further action would be routed in their anonymous versions to the appropriate department at the Naval Safety Center. If they determine that a bona fide problem exists, they could then forward recommendations to the air wing, air station, squadron or staff for action. The Safety Center has never had nor does it want punitive authority. NAVSAFECEN's role would be limited to recommendations to those staffs or officers who do.

A hypothetical example of a NAASREP might help bring the process into focus. A tactical jet lands by mistake at the wrong airport while on a visual approach at night. The civilian field is uncontrolled and no traffic conflict exists. The crew realizes the mistake immediately on touchdown and does a touch and go. An uneventful landing is completed at the nearby intended point of landing.

Under the present reporting system, no report is required. The crew could submit a hazard report since a safety hazard did exist, but the chances are slim that they will confess their error to their squadron superiors who will then submit an official non-privileged report. Most likely, the story will go

untold except perhaps in the bar late one night.

With the NAASREP program in place, however, the crew could submit the report with no one else in the squadron being the wiser. The crew might provide some insight into why they made the error: distraction in the cockpit, unfamiliarity with the area, reluctance to ask for vectors due to pride, etc. An insightful piece of information would then be fed into the computer pertaining to visual approaches and mistaken landings. An interesting article could appear in Approach, with all details sanitized except the two airports involved. And, if this was the fifth NAASREP received by ATC specialists at the Naval Safety Center relating to these two airports, they might recommend that a warning be printed on Approach Plates about possible confusion between the two airports. Finally, safety experts looking into problems related to visual approaches could get a printout on all reports related to visual approaches submitted to NAASREP.

The Navy would not have the "carrot" of immunity from FAA license suspension to stimulate report submission, as does the civilian ASRS program. Why then would the naval aviation community submit these reports? Because they care about safety. Ask a pilot how to improve safety and he will tell you, and tell you and tell you. If the submitter is guaranteed that no negative repercussions will result from his report, there will be plenty of submissions.

The ASRS program was spurred by the TWA crash near Dulles Airport in the mid-1970s, which was caused by confusion over the meaning of "cleared for the approach." Investigators learned later that an identical situation had happened to United Airlines several months earlier, but visual weather conditions enabled the crew to avoid the hills prior to impact. United internally shared its lessons learned, but there was no vehicle available to share the information with the rest of the flying community. The Navy has a similar situation within its squadrons, and it needs a way to share its lessons learned — be they embarrassing or not — with the entire naval aviation community. The NAASREP could be that vehicle.

Anymouse ain't dead yet. It's still available for your use if you want to report on a naval aviation safety hazard anonymously. But we're not getting nearly as many as we used to. Anymouse is 33 years old this year, and it was very popular in the fleet during its early years. Even today we receive some very important letters addressed to Anymouse. Some appear in the magazine. Others are implemented and responded to without publication which still serves a purpose in enhancing safety. In such instances, we don't have to publish them and the system still works. Until such time that Anymouse would be superseded by another system, be it the NAASREP or some other program, keep using Anymouse, Approach Magazine, Naval Safety Center, NAS Norfolk, VA 23511-5796. — Ed.

Cdr. Shipman, a naval reservist with Volunteer Training Unit 8686 at NAS Norfolk, Va., is currently on special assignment to Approach. He was editor of Approach from January 1975 to January 1977. When on active duty, he flew A-4s and A-7s and now is a 727 pilot for People Express Airlines.

Advice to a Fleet

or Ten Pretty Good

By Cdr. James W.

A STUDENT naval aviator recently asked me if I could offer any advice on the subject of flying. Having survived 15 years of cockpit duties, I figured I would be able to come up with a few personal rules to live by that might extend someone else's career of slipping the surly bonds of earth. For that student pilot, and any other interested parties, I submit the following items for consideration. The list is neither complete nor original, but it works.

Fly defensively. If you make *any* assumptions, assume everyone is out to get you. Paranoid though it may sound, it only has to be true once. Ground controllers, your flight lead, your wingman or any other pilot in your airspace can cut short your career or at least ruin your whole day. Defensive flying, like defensive driving, is a state of mind more than anything else. It *doesn't* mean flying scared or unaggressively. It *does* mean adhering to all those cliches you have heard (or will hear) a thousand times: keep your head on a swivel (because *someone* is trying to find you and hit you); look both ways before crossing a runway or taxiway, even though you have been cleared (because the controller is trying to find *two* of you to hit each other); look at your wingman before turning in his direction. I know it's the wingman's responsibility to avoid the leader, but what if the wingman is wrong? It won't make *you* feel any better.

Never do anything in an airplane today that you wouldn't do any other day. You may be tempted to make "one-time exceptions" for special events, that chance to solo on a cool CAVU day, that last chance for a cross-country flight back home, your fly-off after a six-month deployment, that chance to press just a little more to get a good bomb hit or gun kill. If it's not combat and you wouldn't take the airplane or perform the maneuver any other day, don't do it today.

Always pass and acknowledge a lead change positively. Your flight instructors will insist, but you might be surprised how many fleet types are lax with this basic rule. Whether by hand signals or radio, let there be no doubt who has the lead, *ever*. Use your call sign on the radio. If you hear only a "you've got it," steer clear. You will be amazed how many other formation flights are airborne on your frequency.

Use your radar altimeter. Ask any aviator if his radar altimeter has ever gone off when he didn't expect it. How many of those pilots are still here after that surprise we will never know. If it saves you, that's the only statistic that counts. Using the radar altimeter does not mean simply turning it on. Develop a philosophy and live by it. One tactic is to "chase" your altitude, *both in climbs and descents, by frequently resetting the bug to just below your target altitude. Sadly, you will probably lose at least one friend who will fly into the water, most likely at night with no sign of a problem. Accident boards seldom recover the evidence to ascertain the victim's radar altimeter philosophy; they can only guess. Remember that a radar altimeter set too low only serves as a warning of imminent death. Do not rely on the radar altimeter to save you. Do use it wisely.*

Use checklists. Another basic rule, but all too frequently ignored or forgotten. Don't just *read* checklists, *do* them and not by memory. One method is to actually touch each switch or handle on the checklist rather than rely solely on visual cues. Be

edgling Aviator

od Rules to Live By

r. Jam B. Waddell

especially cautious of interruptions to your habit patterns. Many unintentional gear-up landings, for instance, occurred after the pilot interrupted his landing checklist.

Carry and use charts. Everyone carries IFR charts, but what about VFR charts (ONC, TPC, etc.)? Some squadron SOPs require that pilots carry an ONC or TPC with annotated divert fields, hazards and prominent geographical features. This is particularly important when flying in an unfamiliar area. Know the local geography of your arrival airport. When your TACAN and radio fail, the old chart and eyeball will still get you there.

Use the land/taxi light. If you're not doing FCLP or blinding somebody who is, why not use the land/taxi light? It seems to be a Navy hang-up directly related to the macho image. But there is nothing macho about a midair collision in the landing pattern, taxiing off the runway into the dirt, FODding an engine or colliding with a deer — or worse, another aircraft. All of these have happened and could have been avoided by using the land/taxi light.

Know your limitations. Navy pilots, by definition, have big egos. *Controlling* the ego is what keeps you alive. Do a thorough self-evaluation before every flight. Are you physically and emotionally prepared to fly the mission to the best of your ability? If not, don't fly. Sounds simple, but the pressures may seem overwhelming on occasion. You may be prepared to fly, but not **every** type of mission. Just because you have a *current* instrument card doesn't mean you are *proficient* to fly in conditions of 200 foot overcast and one-half mile visibility. Know the difference. Maybe you need to fly a different mission, have a simulator or just take the day off. Your operations officer will help, but as always, the ultimate responsibility lies with the pilot. Make the right choice and come back to fly again.

Think "what if?" At the risk of sounding overly pessimistic, you can stay mentally alert by constantly reminding yourself of what you would do if things went wrong. The "what ifs" should begin in the brief by discussing such items as inadvertent IFR, unintentional loss of sight in a formation flight, departure and spin recovery procedures, the emergency of the day and any particulars pertinent to the specific mission. On the runway or catapult, what if you have to abort or eject? Once airborne, what if oil pressure fails, the engine quits or your navigation systems die? Review your time-critical emergency procedures. On approach, have your TACAN approach plate out, even for an en route descent. What if you lose your radios? What if you don't break out at minimums? What if the aircraft in front of you fouls the runway? "What ifs" are limited only by your imagination. Put another way, it's simply staying ahead of the aircraft. He who is ready lives longer.

Wear your seat belt. What does that have to do with flying? Everything if some bozo rams you with his supercharged roadster on your way home tonight. The other nine rules are meaningless if you buy it on the highway. You are a national asset. Please treat yourself accordingly and happy flying!

Cdr. Waddell is an A-7 pilot and has served tours in VA 105, VA 174 and VA 46. He graduated from the U.S. Navy's Test Pilot School and currently is assigned as assistant readiness officer, Light Attack Wing One. He is the prospective executive officer of VA 72.

Down the Primrose Path. The P-3 had been in the air for six hours after a hectic but successful Ready One launch. Its mission was to conduct surface surveillance for a carrier battle group. The flight was conducted between 500 and 1,500 feet AGL off the west coast of Sicily. Weather had been marginally VFR but had improved during the course of the moonless night mission. The patrol plane commander (PPC) turned the controls over to the co-pilot (2P) after giving him a thorough brief on position and various call-signs.

An additional player in the unfolding drama was an airborne E-2 acting as coordinator for the surveillance mission, which included another P-3 and various fighter and attack aircraft. The P-3 crew had not been briefed on the E-2 coordination role and experienced difficulty in transferring tactical control due to intermittent communication problems.

As the Hawkeye began assigning vectors, the P-3 crew double-checked position while the 2P turned the aircraft to the initial heading. They were just off the west tip of Sicily. Thirty minutes later, the E-2 gave a second heading, turning the P-3 50 degrees farther east. The 2P dutifully turned to the new heading but did not verify his position with the navigator or radar operator. Everyone in the aircraft was busy working on the tacti-

cal problem and no one correlated the aircraft's position with the surrounding terrain.

After a few minutes, the 2P identified lights on the coast and what appeared to be a large, dark cloud directly ahead of the aircraft. The Tactical Coordinator (TACCO) called to say that continuing their current direction of flight would take them over land and through the standoff distances for the exercise. At this point, the 2P called the radar operator and asked him about the dark cloud but the radar operator didn't answer. The 2P then decided to fly to the right of the cloud, which turned out to be a small mountain 700 feet above the altitude of the P-3.

The PPC, still back in the tube, called for the radar to be brought up. The coast of Sicily and two islands came into view on the screen. Meanwhile, the 2P had called for power and begun to climb. When things settled down, the P-3 called the E-2 for positional verification. It was only then that the E-2 disclosed it was not receiving this P-3's IFF and that, in fact, its heading calls had been meant for another aircraft!

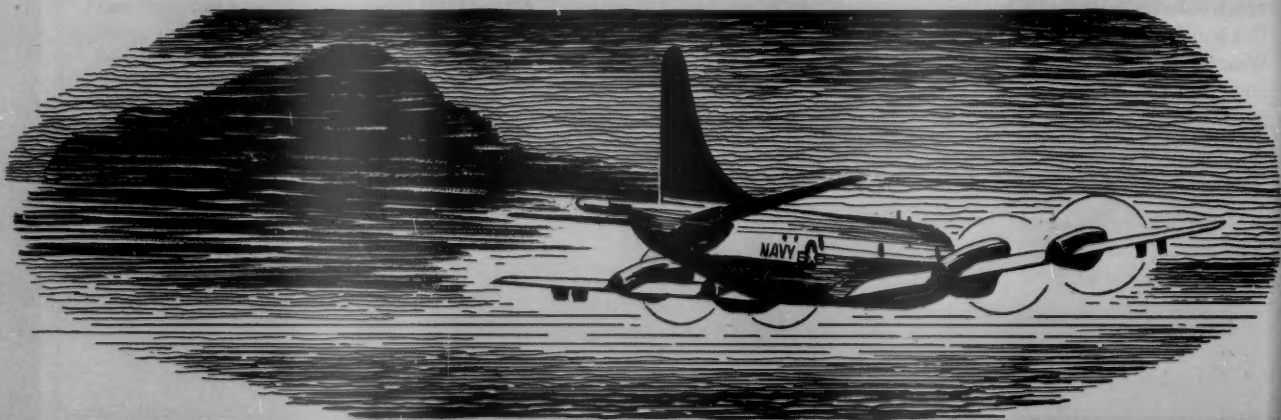
This familiar scenario continues to plague all communities. It is a major contributor to the multiengine Class A mishap rate. Regardless of your community, this crew's experience points out several areas which may prevent you from becoming a Con-

trolled-Flight-Into-Terrain statistic. The bottom line is this: stay aware of your position at all times. Do not be lulled into complacency because you are being controlled by another facility or aircraft. Do not hesitate to question another crew member when you see a potentially dangerous situation developing. Crew coordination, so important in developing an effective operational team, is also essential to the safety of the mission — LCdr. John Wilhelm. P-3 analyst, Naval Safety Center.

Tomcat Hydraulic Failure. It was late evening in the Indian Ocean, and I was standing the SDO duty. Ten minutes after a pair of our squadron F-14s had launched, I was informed that one had experienced a combined hydraulic failure. A squadron representative was sent to operations. Minutes later, another aircraft reported the same emergency.

At first, I wasn't sure whether we had two separate emergencies, or one aircraft reporting the same thing twice. After sorting it out, we determined that one of the aircraft that had launched had an emergency, and one that was recovering also had a hydraulic failure.

The aircraft that had just launched was recovered without any further complications. The second F-14 was on final approach for a trap. Everything looked fine. The aircraft was on



AIR BREAKS

center line, on glide slope. The only thing that could ruin the approach was the dreaded, night fouled-deck wave-off. That's what happened! Once the Tomcat was re-established on downwind, it lost its second hydraulic system and began to lose controllability.

The pilot determined there was no way he could land the aircraft aboard the carrier.

The aircraft headed for a divert field, 80 nm away, with enough gas to comply with a dirty bingo situation. En route, we heard the pilot state that he had to leave the throttles at military and control the nose attitude with rudder in order to keep the aircraft in the air. Consequently, due to the higher than expected power setting and higher fuel flow, the aircraft ran out of fuel 30 nm from the divert field.

Another F-14, flying as escort, kept us informed during the subsequent ejection and SAR effort. Both the pilot and RIO were picked up by helo and returned to the carrier, relatively unharmed. The cause for the dual hydraulic failure could not be determined.

Submitted by LCdr. G.R. Luechauer, Safety Officer, VF 111.

This crew complied perfectly with every known procedure, but in the final analysis, it wasn't enough. Their sound airmanship and preparation led to a picture-perfect dual ejection.
— Ed.

The Foggiest Notion. Ceiling was zero, visibility one-eighth mile in fog as the A-3 taxied to the active runway. Approximately 1,500 feet from the departure end, the crew noticed a flashing yellow light from a maintenance vehicle on the runway near the arresting cable. Although they could not make out the type of vehicle, the crew made a mental note as the tower cleared them into "position and hold." Thirty seconds after positioning the aircraft on the runway, the pilot was cleared for takeoff. But

the co-pilot told the tower that the maintenance truck was still on the runway as evidenced by the flashing yellow beacon.

The tower cancelled the takeoff clearance, and two minutes later, the vehicle left the runway, its beacon disappearing in the fog. The takeoff clearance was reissued and an uneventful instrument departure accomplished.

The det OINC's comments were, in part:

"When operating in marginal weather conditions, a legal takeoff alternate is incidental if the aircraft involved hits a truck on takeoff roll... Reduced visibility operations pose unknown risks of incalculable proportions. The aircrew is dependent upon the support activities and their equipment to execute and operate flawlessly. Understanding and clarification through verbal communications is absolutely necessary to reduce the risks of inattention or confusion on the part of the controllers or aircrew."

Canopy Clamps A Mech. The Intruder had been moved out to the line the previous night. The brake rider could not get the canopy to open normally. To gain access to the cockpit, he pumped the clamshell partially open, then he and a tow rider accomplished their task. However, they did not tell maintenance control about the partially-open canopy nor a possible dead battery.

Later that night, as the night maintenance duty officer (NMDO) was touring the line, he noticed the A-6 with the canopy open. It was raining and he tried to close the canopy without success, using the boarding ladder switch on the starboard side. The NMDO waited 10 minutes and tried again. This time, he heard the auxiliary pump operate for one or two seconds before it stopped. The NMDO assumed the battery was dead and left the aircraft, instructing a squad-

ron plane captain to close the canopy later. The NMDO then told maintenance control about the problem.

Ten minutes later, the plane captain entered maintenance control and the NMDO reminded him to secure the canopy.

Three hours later, while conducting turnaround inspections, the plane captain went over to the A-6 to close the canopy. He had no luck and checked to ensure that the B/N's boarding ladder was up. He also checked the nosewheel well for popped circuit breakers, and the auxiliary hydraulic pump by actuating the switch to close the birdcage.

He then climbed the pilot's boarding ladder to check for popped circuit breakers in the cockpit, saw one, and leaned in to reset the circuit breaker. He began to raise himself from the cockpit when he realized the canopy was closing. He couldn't reach the canopy switch nor the circuit breaker. By the time the canopy stopped, it was nearly closed on the starboard side with the hapless plane captain painfully pinned on the port side.

Another plane captain saw the man pinned by the aircraft canopy, but was unable to release his compatriot, so he ran for help. It took several people including the crash crew to extricate the injured plane captain from his predicament.

The apparent cause of the canopy problem was insufficient voltage in the battery to operate the auxiliary pump. However, *the spring-loaded switch in the pilot's boarding ladder failed to return to the neutral position, remaining in the closed position.* The plane captain was unaware of the switch's position. When he reset the popped circuit breaker, it allowed DC electrical power to run through the completed circuit to the auxiliary power pump. The partially-closed canopy began to close before he realized the danger and could pull himself clear. ◀



20

Atlantic Ocean

... And Then T



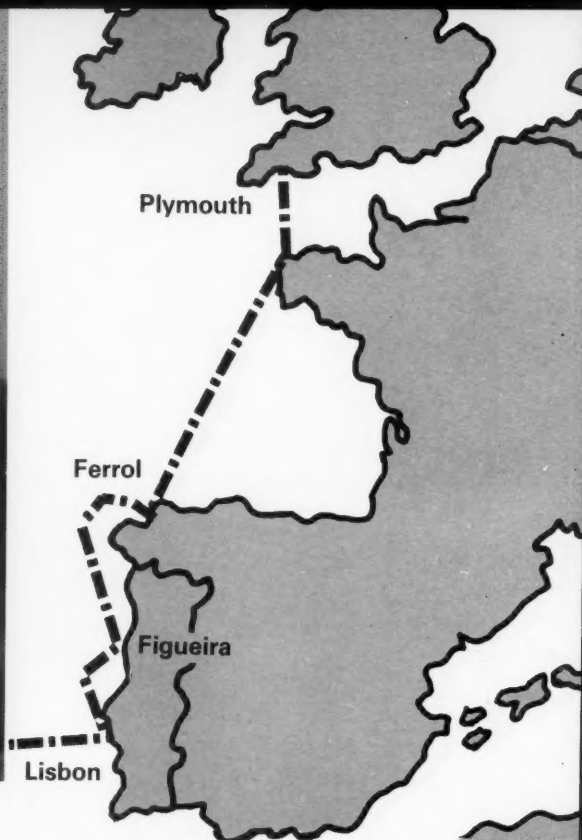
The crew of the NC-4, left to right, foreground, Chief Machinist's Mate (Aviation) Eugene S. Rhoads, Lt. James L. Breese, engineer; LCdr. Albert C. Read, commander; Ltjg. Walter Hinton, pilot; on aircraft, Ens. Herbert C. Rodd, radio operator, Coast Guard Lt. Elmer F. Stone, pilot.

Ted Withur





The NC-4 in flight over the Atlantic.



n There Was One

An article we would have used in the May 1920 issue of Approach. The author is unknown.

21

The NC flying boats used on the transatlantic flight were a product of World War I naval aircraft development. In August 1917, Adm. D.W. Taylor, Chief Constructor, wanted a flying boat for use against enemy submarines. It should have long range and, in fact, be capable of crossing the Atlantic under its own power to reach the center of enemy submarine activity.

The armistice came before the planes could be produced in quantity, but the transatlantic flight undertaken by three of the first four planes was a service test of how well the designers had carried out their assignment. The boats were designated NC, the N for Navy and the C for Curtiss, because they were a joint product of the Navy and the Curtiss Engineering Corporation. The designers were Mr. Glenn Curtiss and Mr. W.L. Gilmore of the Curtiss Co., and Commanders G.C. Westervelt, H.C. Richardson and J.C. Hunsaker of the Navy.

The hull of the NC was 45 feet long with a 10-foot beam. The bottom was a double-plank V with a single step. Five bulkheads divided the hull into six watertight compartments with watertight doors and a wing passage for access. The bare hull weighed only 2,800 pounds, yet the displacement was 28,000 pounds, this giving a ratio of 0.1 pound of boat per pound of displacement. This lightness was the result of careful selection and distribution of materials. The keel was Sitka spruce, while the bottom planking was Spanish cedar. Longitudinal strength was given by two girders of ash braced with

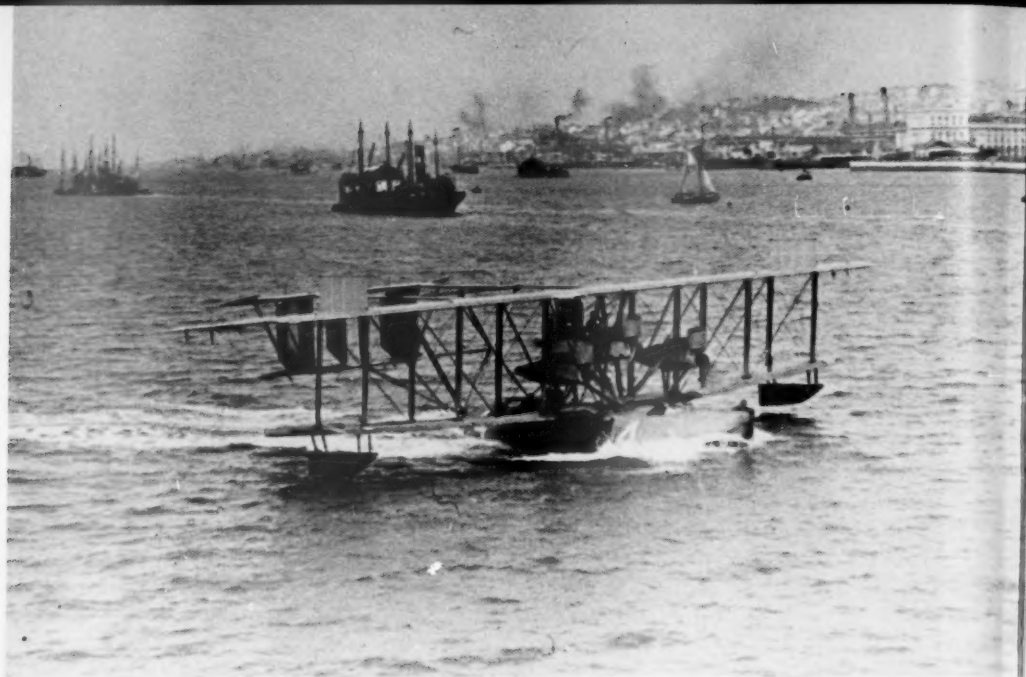
steel wire. To guarantee watertightness and yet keep the planking thin there was a layer of muslin set in marine glue between the two plies of planking.

The wings carried a load of 11.7 pounds per square foot in the air, but the structural weight was only 1.2 pounds per square foot. The total wing area was 2,380 square feet. The main wing spars were hollow spruce boxes. Each rib was a truss designed like a bridge consisting of continuous cap strips of spruce, corresponding to the upper and lower chords of a bridge truss, tied together by an internal web system of vertical or diagonal pieces of spruce. The ribs were 12 feet long but weighed only 26 ounces each.

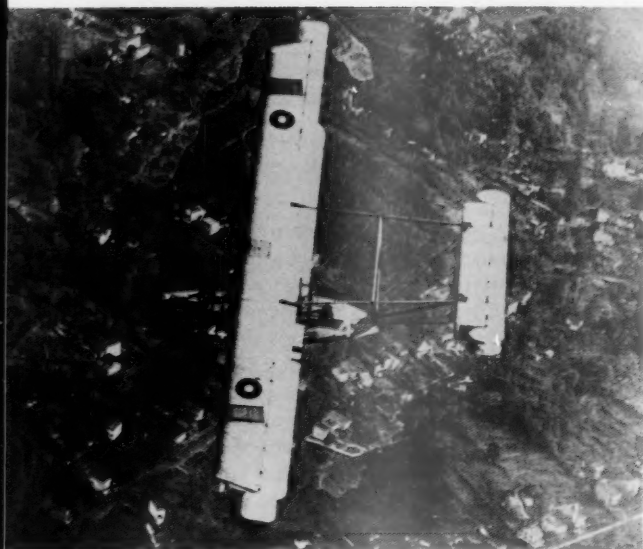
An interesting detail of the wing construction was the hinged leading edge which enclosed the control cables to the ailerons. This eliminated the air resistance of these cables. At the same time they were accessible for inspection by merely swinging up the leading edge on its hinges.

The tail surfaces of the NC were made up as a biplane that resembled in general appearance and size the usual airplane. The NC tail was, in fact, twice as large as the ordinary complete single-seater fighting airplane. It was over 500 square feet in area, and the structure was supported by three hollow spruce booms braced by steel cable in such a way as to remain clear of all breaking seas and to permit a machine gun to be fired straight aft from the stern compartment without interference.

Continued



At the end of the historic transatlantic flight, the NC-4 lands in the Tagus River off Lisbon, Portugal.



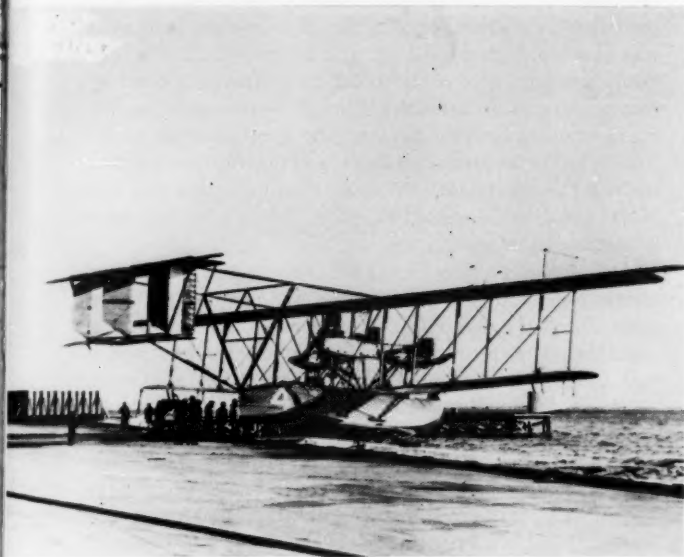
The NC-4 in flight over the U.S.

The four Liberty engines that drove the boat were mounted between the wings. At 400 horsepower per engine, the maximum power was 1,600 horsepower or with the full load of 28,000 pounds, 17.5 pounds carried per horsepower. One engine was mounted with a tractor propeller on each side of the center line and on the center line the two remaining engines were mounted in tandem, or one behind the other. The front engine had a tractor propeller and the rear engine a pusher propeller.

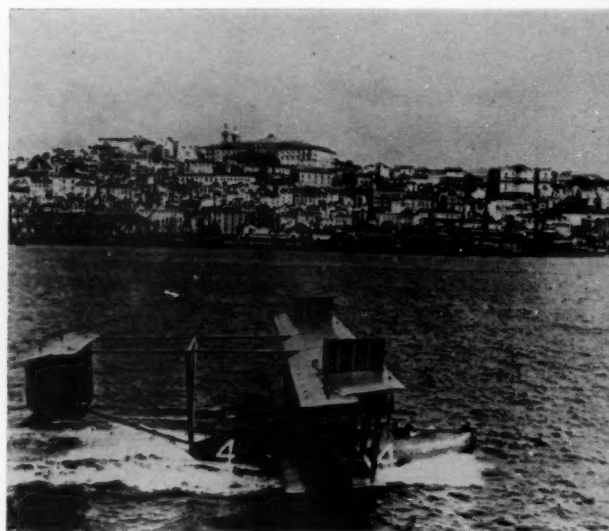
A fully loaded flying boat weighed 28,000 pounds. When empty (but including radiator water, fixed instruments and equipment) it weighed 15,874 pounds. The useful load available for crew, supplies and fuel was, therefore, 12,126 pounds or over 43 percent.

The NC was capable of an endurance flight of 1,400 miles, carrying a crew of five men (700 pounds), radio and radiotelephone (220 pounds), food and water, signal lights, spare parts and miscellaneous equipment (524 pounds), oil (750 pounds) and gasoline (9,650 pounds). The radio outfit was of sufficient power to communicate with ships 200 miles away. The radiotelephone could be used to talk to other planes in a formation or within a distance of 25 miles.

The first of four NC flying boats was flown on Oct. 4, 1918, approximately one year from the start of design. It was necessary to make changes in the position of the horizontal stabilizer to neutralize a slightly tail-heavy condition, but otherwise no radical changes were required in the design or construction. The second NC boat, the NC-2, was completed in March 1919, and the NC-3 and NC-4 were completed in April 1919. Due to damage to two outer-wing sections while at anchor in a gale late in March 1919, the NC-1 was put temporarily out of commission. After the completion of weight-lifting trials on the NC-2, the outer-wing sections of that boat were transferred to the NC-1, as no spares were available. As a result only three



Left: The NC-4 back in the U.S. in December 1919; below: another view of the NC-4's arrival in Lisbon, as she taxis to her waterfront berth for a gala reception.



NC boats remained available for the transatlantic flight.

The three flying boats, NC-1, NC-3 and NC-4, were placed in commission on May 2, 1919, and Cdr. J.H. Towers assumed command of NC Seaplane Division 1, which included all three boats. This was the first time in the history of the Navy that any aircraft had been placed in regular commission. In addition, Cdr. Towers was detailed to command the NC-3, which became the flagship of the division; LCdr. P.N. L. Bellinger was detailed to command the NC-1 and LCdr. A.C. Read to command the NC-4.

Plans for the transatlantic flight called for a route from Newfoundland to Portugal via the Azores. These distances were the shortest and this route had the fewest areas of uncertain weather. A patrol of destroyers was established along this route, so as to reduce the danger to personnel to a minimum. At all ports of call, mother ships were stationed in order to provide fuel, spare parts, and repair facilities for the planes.

The actual start of the flight was made from the Naval Air Station, Rockaway, Long Island, on May 8, 1919. The first leg was from this station to Halifax, Nova Scotia. Leaving Rockaway at 10 a.m., all three airplanes preserved formation. Everything went well until about 2:30 p.m., when the NC-4 was forced to drop astern because of engine trouble. Shortly afterwards additional engine trouble forced the NC-4 to land about 80 miles east of Cape Cod and the plane was taxied under its own power to the Naval Air Station at Chatham, Mass. In the meantime the NC-1 and NC-3 continued their flight to Halifax and arrived there around 7 p.m.

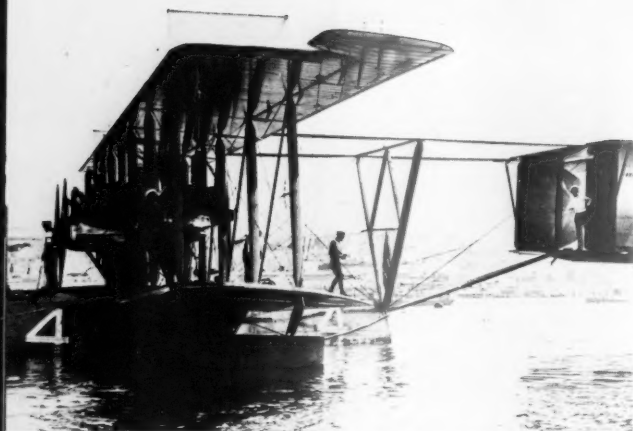
Preparations for the second leg of the flight from Halifax to Trepassey, Newfoundland, were completed on the morning of May 10. The NC-1 was taxiing about the harbor waiting for the NC-3 to take off. Then a starting motor on the latter broke. The NC-1 was thereupon directed to proceed to Trep-

assey by itself and the NC-3 started shortly afterwards. Both planes arrived at Trepassey in the late afternoon of May 10. These two planes were joined at Trepassey by the NC-4 on May 15 from Chatham via Halifax.

Personnel of the NC-1 and NC-3 helped the crew of the NC-4 change one engine, fit the airplane with new propellers and get her ready for departure the following afternoon. Reports from the weather bureau, the meteorological officer and the weather bureau representative at Trepassey all indicated very favorable weather and advised a start on the afternoon of May 16. A start was decided upon, and all three airplanes took off that afternoon for Horta, in the Azores.

Formation was assumed and was fairly well-preserved during the afternoon and evening. Later it became dark and overcast. The running lights of the NC-3 stopped functioning, the three planes soon lost each other and each continued the flight independently. About 8 a.m. the three planes encountered intermittent rainfalls and a very thick fog. As the Azores were approached the fog became thicker, making it impossible to obtain a reliable sextant altitude of the sun. Various altitudes were tried to avoid the fog, but it merged with the clouds that, most of the time, extended very high and made flying at any altitude over 1,000 feet very difficult.

Shortly before noon the NC-1 landed to determine its



At home at Rockaway Naval Air Station, Long Island, New York after her flight.

position by taking radio-compass bearings on destroyers, but the water conditions were worse than had been expected and entirely too rough to take off again. A 22-mile per hour wind was blowing, with a cross sea and a heavy swell. For four hours attempts were made to call to destroyers for aid by means of the radio, but with no success. In the meantime, the sea had carried away the elevators and a portion of the wings. Finally late in the afternoon the crew of the NC-1 were picked up by a passing steamer, the Greek ship *Ionia*, and taken to Horta while the plane itself was subsequently sunk to remove a menace to shipping.

At 1:30 p.m. on May 17, the NC-3 also landed in order to obtain radio-compass bearings and was unable to take off again due to the rough sea and to damages received in landings. The plane's position was obtained, however, by means of radio-compass bearings as being $34\frac{1}{2}$ miles southwest of Horta. Due to damage to the radio apparatus evidently received while landing, the NC-3 now found itself able to receive messages but unable to send, except on a short-range battery set. Those messages, however, were not intercepted by the ships. A heavy storm arose that afternoon and for $2\frac{1}{2}$ days the NC-3 fought that storm and endeavored to utilize the very limited sailing qualities of the NC-3 toward getting to the Island of San Miguel. On the evening of May 19, the NC-3 finally reached the port of Ponta Delgada.

The NC-4 reached Horta safely on the afternoon of May 17, completing the distance of 1,200 nautical miles from Trepassey to Horta in 15 hours and 18 minutes. The NC-4 was thus the only plane left to continue the flight. The personnel of the other two planes were taken aboard the *Bainbridge* to Lisbon and then to Plymouth by the *Rochester*.

The NC-4 was held at Horta by fog and later by a gale until May 20, when it flew from Horta to Ponta Delgada. The trip took about two hours. Here the NC-4 waited six days for favorable weather and sea conditions. The plane was too near its goal at this point to take any unnecessary chances for the sake of completing the flight a day or two sooner. Finally, early in the morning of May 27, the NC-4 departed from Ponta Delgada for Lisbon and arrived at Lisbon in the evening of the same day, completing the first crossing of the Atlantic by air.

On May 30, the NC-4 got an early morning start for the last leg of the trip from Lisbon to Plymouth. After about two hours of flying, however, a leak was discovered in the port engine and it became necessary to land in the mouth of the Mondego River, near Figueira, Portugal, to make repairs. Repairs completed, the NC-4 left about 2 p.m. for Ferrol, Spain. It was too late by this time to attempt to make Plymouth before dark. Ferrol was reached about 4:30 in the afternoon. The following morning the NC-4 left Ferrol for Plymouth, and at 1:30 that afternoon (May 31) arrived safely at Plymouth, England. ▶

On May 8, 1986, in a reenactment of the NC-4 transatlantic flight with takeoff from Jamaica Bay, New York, two PBV Catalinas will attempt to follow the NCs' route across the Atlantic. This commemorative flight will be one of the highlights of the year-long observance of the 75th anniversary of U.S. Naval Aviation. — Ed.

Time Table of the NC-4

	Greenwich Mean Civil Time	Elapsed Time in Air	
		Hours	Minutes
Left Rockaway	2:02 p.m. May 8		
Arr. 80 miles off Cape Cod	6:53 p.m. 8	4	51
Left Chatham	1:07 p.m. May 14		
Arr. Halifax	5:10 p.m. 14	4	3
Left Halifax	12:53 p.m. May 15		
Arr. Trepassy	9:39 p.m. 15*	6	23
Left Trepassy	10:05 p.m. May 16		
Arr. Horta, Azores	1:23 p.m. 17**	15	13
Left Horta	12:39 p.m. May 20		
Arr. Ponta Delgada	2:24 p.m. 20	1	45
Left Ponta Delgada	10:18 a.m. May 27		
Arr. Lisbon	8:01 p.m. 27	9	43
Left Lisbon	5:29 a.m. May 30		
Arr. Mondego River	7:21 a.m. 30	1	52
Left Mondego River	1:38 p.m. May 30		
Arr. Ferrol	4:47 p.m. 30	3	9
Left Ferrol	6:27 a.m. May 31		
Arr. Plymouth	1:26 p.m. 31	6	59
Total		53	58

*Includes time down for repairs of one hour 23 minutes which is not counted as time in the air.

**Made a preliminary landing in a bight mistaken for Horta and was down for five minutes which is not counted as time in the air.

Officers and Crews for the Transatlantic Flight

NC Seaplane Division No. 1

Cdr. John H. Towers, USN, Commanding

NC-3 (Flagship)

Cdr. John H. Towers, USN, Commanding

Cdr. Holden C. Richardson (CC) USN

LCdr. Robert A. Lavender, USN

Lt. David H. McCulloch, USNRF

Boatswain Lloyd R. Moore, USN

NC-1

LCdr. Patrick N.L. Bellinger, USN, Commanding

LCdr. Marc A. Mitscher, USN

Lt. Louis T. Barin, USNRF

Ltjg Harry Sadenwater, USNRF

Machinist Rasmus Christensen, USN

Chief Machinist Mate C.I. Kesler, USN

NC-4

LCdr. Albert C. Read, USN, Commanding

1st Lt. Elmer F. Stone, USCG

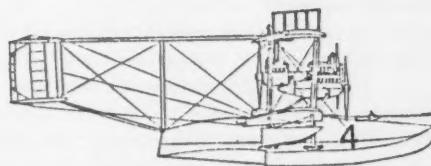
Lt. James L. Breese, USNRF

Lt. Walter Hinton, USN

Ens. Herbert C. Rodd, USNRF

Chief Machinist Mate Eugene S. Rhoads, USN

LCdr. R.E. Byrd and Ltjg. B.L. Rhodes in the NC-3 and Ens. C.J. McCarthy in the NC-1, were on the flight only as far as Trepassy.



Riding with Experience

By Lt. R.L. Roberts



WOULD you rather ride in an aircraft with a nugget pilot who has been in your squadron less than one year, or a second-tour "stick" with 2,000 hours in model and centurion patches all over his flight jacket? The answer may not be as obvious as it seems.

Consider this situation: Toward the end of a night hop, your pilot, a second-tour lieutenant commander just out of a refresher session at the replacement squadron, decides to practice some night plugs on the A-7. As the "new guy" in the squadron, your only tanking experience involved day plugs on an A-6. Unaware that your pilot has a word-of-mouth reputation within the air wing as being weak on the tanker and around the boat, you are enthusiastic about a new experience. Although at first you are comfortable riding with a pilot who **should** be one of the most capable in the squadron, your enthusiasm quickly wanes as rough stabs at the basket and excessive power and flight path deviations make it apparent that your pilot is either marginally safe or badly out of practice. How close to a midair collision, or a cracked canopy resulting from a basket slap, do you allow this pilot to get before you speak up?

Later on in the same tour, you have two cruises under your belt and have been designated a Mission Commander. You are selected for a night double cycle with a "new guy" pilot, and are scheduled to recover in marginal weather conditions. Smart money says you will be much less reluctant to offer advice or take whatever action is necessary to ensure a safe recovery than you were on that first night tanking hop, even if the nugget is a talented stick with good landing grades and heads-up composure in the aircraft.

These situations are, of course, at opposite ends of the spectrum. Your reaction in either situation is natural and understandable. Any hesitancy in the first example must be recognized and overcome. A wide gap in experience and rank between crew members is commonly used to enhance training;



it must not inhibit junior crew members when safety is at stake.

Highly experienced pilots are respected for their hours, and rightly so. In most cases, they have attained their position through hard work and safe, efficient performance. Many pilots who have a reputation for being good sticks are in this group. However, in some cases, "second-tour" pilots arrive in the squadron having been away from consistent flying in their model, as a result of varied career paths. Shore duty in a non-flying billet followed by a tour aboard ship or in postgraduate school means many years during which flying skills are not kept sharp. Although the airmanship skills and knowledge exist, it takes practice to polish off the rough edges and return to the proficiency level attained during the first squadron tour. In certain respects they resemble a nugget pilot, in that if they encounter problems airborne, it is helpful to have a crewman with current experience in the cockpit to help rectify the situation. Sometimes it is as simple as a timely safety of flight intercom or radio call; sometimes it requires some cockpit leadership to initiate proper NATOPS procedures.

It is natural when flying with one of the new guys to watch him very carefully, and possibly be more critical of his flying. Conversely, it can be more comforting to be crewed with one of the veterans, particularly for the nugget crewman fresh out of his fleet replacement squadron.

Of course, any pilot very quickly gains a reputation within his squadron if he has a high number of basket slaps on the tanker, catches the one wire or bolters often, flies rough formation, or reacts poorly to emergencies. A second-tour pilot may not receive the same scrutiny from the highest levels of the command as a nugget does. A twofold problem can exist for the junior crewman who flies with the second-tour aviator.

The first problem is the natural amount of complacency which may result from flying with the veteran, who is

theoretically safer to fly with. This can only be overcome through constant situational awareness; an ex-test pilot who hasn't had a cut pass all cruise is just as dead from a ramp strike as a nugget pilot on his first CQ det.

The second problem is that a junior officer may not be comfortable taking the necessary action to rectify a situation when the pilot outranks him. This feeling may cause enough hesitation that his action, be it as simple as an altitude call or as pressing as initiating command ejection, is delayed just long enough to result in disaster. It is for this reason that several commercial airline companies have recently introduced assertiveness training for their junior crew members.

These are not new problems. A comprehensive and consistent NATOPS and standardization program will prevent them from arising. Proper training, NATOPS check procedures and qualification standards will result in a safe flying environment, in which there should be *no preference* as to which pilot the junior crewman will want to fly with from a safety point of view. When unsafe practices are recognized in any pilot, command attention is required.

Requalifying experienced pilots as plane commanders is not automatic. Normal squadron standardization and qualification procedures should preclude problems. If squadron NATOPS officers have direct access to the Commanding Officer, individual problems can be handled in a safe and professional manner. It must also be remembered that the statements, "You are responsible for your own safety at all times," and, "Even your friends are out to kill you," have become cliches because they are so appropriate.

An unsafe incident is important enough to bypass the chain of command to inform the Commanding Officer. The normal routing through the safety department should be used. However, if necessary, even this should be bypassed rather than have an incident buried. An unsafe pilot cannot be ignored, regardless of his rank or experience level. ◀

Lt. Roberts is the NFO NATOPS officer for VS 31.

LCdr. Jonathan W. Snyder (left),
LCdr. Thomas L. Glaser (right).



LCdr. Jonathan W. Snyder
LCdr. Thomas L. Glaser
VF 151

The aircrew manned up their F-4S Phantom, call sign Switchbox 215, on what was scheduled to be a post-maintenance check flight. The weather was forecast to be Case III due to seasonal Indian Ocean haze conditions. Preflight and launch went as briefed. During the climbout, however, Switchbox 215 experienced a complete radio failure, followed by failures of the PC-1 and utility hydraulic systems. This combination of failures left the aircrew with operable flight controls on only one wing, and the stabilator, emergency extension of the air refueling probe, landing gear and flaps, no nose gear steering, emergency brakes, and an approach speed more than 70 knots above normal. With this emergency, the aircrew was left with two decisions; fly the Phantom to the nearest divert landing facility or bring it down the port side for a controlled ejection. NATOPS prohibits carrier landings in this situation. The first option was chosen and the decision was made to divert to Diego Garcia, over 1,000 miles away.

Squawking emergency and communicating with only a PRC-90 survival radio, the RIO, LCdr. Glaser, communicated the Phantom's emergency situation and intentions to an escort KA-6D. The crippled fighter was then joined by an additional KA-6D tanker and US-3 Pathfinder and proceeded to Diego Garcia. Throughout the flight, the rudder was deflected to the right creating additional difficulties to the Phantom's remaining control surfaces. Unable to trim the rudder out, LCdr. Snyder flew the Phantom on a three-hour flight with a constant 35 pounds of force to compensate for the deflected rudder. Additionally, the aircrew topped off twice from the escort KA-6s.

After a controllability check and a final review of the NATOPS pocket checklist for landing with a PC-1 and utility hydraulic failure, the aircrew commenced their approach. The weather conditions at NAS Diego Garcia were good but the field was soon to go IMC in rain showers. The approach went smoothly. The F-4S touched down at 215 knots with the hook down, LCdr. Snyder applied aft stick to set the hook 500 feet prior to the midfield gear but the hook skipped the wire. The pilot immediately deployed the drag chute and his RIO called for pneumatic brakes. With 150 knots and 3,000 feet remaining, the port mainmount blew. The aircraft veered left and skidded to a stop perpendicular to the centerline, 6 feet from the runway edge. Five minutes after the landing, the field went IFR in rain showers.

approach/may 1986

BRAVO ZULU



Cdr. Rick Marquis
VA 66

After a two-hour day surface surveillance mission in the Eastern Mediterranean, Cdr. Marquis felt a sudden engine vibration in his A-7E Corsair II while holding overhead USS *Dwight D. Eisenhower* (CV 69) for recovery. Checking his engine instruments, he saw the oil quantity gauge suddenly go to one-half, illuminating the master caution light. Sensing an impending engine failure, Cdr. Marquis declared an emergency, immediately turned towards the abeam position, extended the emergency power package and lowered his gear and flaps. With a steady stream of oil pouring from the engine, the oil quantity went to "low" and the oil pressure started dropping. The IKE responded immediately with a ready deck as Waldo 311 rolled into the groove. With zero oil pressure and a rapidly deteriorating situation, Cdr. Marquis flew an OK pass to an arrestment. Post-flight inspection revealed extensive turbine damage and a total loss of engine oil. Total time from first engine rumble to shutdown on deck was less than five minutes.

approach/may 1986

Out on the Tip of the Sword

By Cdr. G. Pat Tierney

I CLIMBED down from the control tower and beat a hasty retreat forward to Combat. As I entered I noticed I was sweating slightly, a cold sweat. The space was cool and dark with the mildly acrid smell of warm electrical insulation. How did I let myself get into this mess? The Captain, a calm yet stern gentleman, was standing behind the ASAC (ASW Air Controller) gazing into his scope. He looked up as I closed the door.

"Well, Pat, are we in trouble?"

30 "No, sir," I responded casually, hoping he wouldn't notice the moisture on my forehead. "We just have to shift to full instrument procedures. The fuel is OK." We stared into each other's eyes momentarily.

He had come to trust me in the last three months since we came aboard. We always launched on time, and, as officer-in-charge, I always kept him well-informed. We kept our spaces clean and won praise for the ship from the DESRON on more than one occasion. Now, I was afraid all that trust was about to come crashing down, along with an aircraft.

As the Captain turned back to the plotter to worry about where we were, I told the ASAC to set up a low visibility approach to starboard, the helo already on the outbound wave-off.

I was to blame, of course. I had stretched the detachment and the ship just a little too far. Experienced and confident, I was infatuated with executing our difficult assignment to the full potential of our multi-purpose system. Our lone ship sailed on a sensitive mission of national importance, we were told. There would be no diversions in case of emergency. I was determined that our detachment would meet that challenge.

We were three weeks out of port in the far northern Pacific, and it was a fine autumn day — above 4,000 feet, that is. For the last week, a low, dense cloud cover blanketed the sub-Arctic sky. Curiously, the ceiling always remained about 100 to 300 feet above the surface of the ocean. From the bridge, you could see all the way to the horizon, but transitioning to forward flight from liftoff gave you instant IFR.

The IFR rules and the squadron guidelines were thrashed

about at our weekly safety review in the wardroom. We all knew what they were and nothing said we couldn't fly in this stuff, especially if it was an "operational necessity." It all came down to common sense. We flavored our pre-deployment workup with lots of night and IFR training, especially in the simulator. Didn't we review and practice low visibility approaches and IFR emergencies over and over with the det and each of the watch sections, for just such an occasion? We were at the peak of our instrument flying ability, we rationalized.

The aircraft commander — I'll call him Tim — called his downwind turn and 400 pounds of fuel, about 20 minutes (plus or minus 10 for this aircraft). Sometimes, when the aircraft got wet, the fuel gauge went crazy and the needle wouldn't stop dancing around. If Tim was worried, his voice didn't betray him. He was an old hand at instrument flying, but on the last two visual approaches he couldn't find the flight deck, and avoided the MAC (mast/stack) only seconds before it emerged from the fog. The ceiling tricked us; it performed the unexpected and fell into the sea.

The mission the crew was returning from was the same one we had flown on numerous occasions during the past three days. I had flown it the previous morning. We started with a gradual low-hover launch and standard rate turn instrument climbout until we broke out about 3,000 to 4,000 feet. Marking on top with radar and TACAN, we set up our plotting board before starting downrange. This was in the days before TACNAV. Because of our mission, we had to cross-check our position with radar and TACAN every two minutes. About 50 miles downrange we would find our targets and start a standard instrument descent until we broke out under the layer. Setting up our checker buoy and recorder, we stayed VFR until the mission was completed, then returned to the ship the way we came. It was this exact mission profile the crew had just completed.

At the two-mile gate, Tim reported 150 feet and "popeye." I asked the tactical action officer (TAO) for every ship's light that wasn't on already, from the Red Head to the anchor light. I even asked to roll up the hangar door and turn on the hangar



bay lights. A quick call to the Captain now on the bridge yielded a crisp "Make it so." Although he sounded like a true professional, I'm sure the Captain's mind was also demanding to know how he had allowed himself to be tricked into such a dangerous position.

Tim followed the ASAC just as in practice, but at one-quarter mile still no "tally-ho." As the aircraft's radar blip disappeared in the sea return, the ASAC gave the standard wave-off spiel. He looked up at me and I saw the fear in his eyes.

At 30 knots, the airspeed indicator on the aircraft is worthless. Knowing the procedures and trusting in my crew, I knew they had a good relative plot and good ground speed indications. As the seconds trudged by, I visualized the crew at almost a hover, completely IFR, frantically trying to scan the murky fog for dark gray metal. My mind flashed to a friend who had put his aircraft in the water in a similar situation less than two years earlier. He and his crew survived. But all the ritual survival equipment inspections and reviews, and all the devout discussions on ditching gave me no comfort. If Tim hits the ship, the flying debris and ensuing fire will claim more than just the helicopter crew. Perhaps we should be at General Quarters instead of Flight Quarters.

"Control, three seven, we just saw the MAC as we waved off." Not good. Shortly, as I stood feeling completely useless behind the ASAC, the TAO came over and told me the port lookout just reported hearing the helo close aboard, but didn't see it.

"320 pounds," Tim blandly mentioned over the circuit. "On my downwind we came across a clearing. We might be able to direct the ship over there. If not, I'm going to stay close and try a short approach." I told the ASAC to tell him we will stay on course and the deck will remain green.

Welcome to extremis! If we try to maneuver the ship, he can't land. Even if we find the clearing, we would have to simultaneously get into the wind, and be within the pitch and roll envelope for an immediate landing. One too many ifs.

Tim was telling me something. He was all through going out on three-mile instrument approaches. He was ready to abandon the safety of that familiar procedure. I prayed he would not abandon the two-man instrument approach scan we had worked so hard to perfect. But if he goes in, he wants to be where the ship can pick him up with a precise Williamson turn. I could almost hear him review the expected ditching with the crew. We made it a standard exercise on many of our flights.

He can maneuver at slow speed IFR and get behind the ship. It's just that he can't see the ship when he gets there. An instrument approach will not solve the problem, just better visibility.

"About 200 pounds to splash." My God, he's only got a few minutes. By now, completely disgusted with myself, I started to the bridge to review the ditching with the CO. Then something we discussed during workup popped into my head. I ran to the sqawk box.

"Hangar, Combat, break out a box of Mark 25s and meet me on the flight deck." A quick brief of the ASAC and I ran back down the port side weather deck. The sky remained a uniform gray mass enshrouding the ship. The chief and AW met me with the box of smoke flares. "Throw one over every 30 seconds." I guessed at the spacing without thinking. Tim was trying to set up astern to follow the flares into the ship. As I watched the phosphorous lights drift aft in the gloom, I realized we had over 100 flares aboard. Why save them? "Try one every five seconds."

The din of the rotors seemed to be coming from all directions and never getting closer. The chief called for more flares. Well into the second box, and still no helo. This is the last approach; I was out of ideas.

Finally! Out of the gray, just above the water and to the right of the flare line, the helo inched forward, his closure almost imperceptible. Tim was not going to wave off this time.

When the helo was back on deck and shut down, I went out on the flight deck to congratulate the crew. Before our adrenalin had a chance to settle, the sky suddenly parted and the sun lit up the ship. We had to squint to see. Instinctively, Tim and I looked down at our watches. Could we have found this clearing for an easier landing? Perhaps not. We would have had a theoretical five minutes of fuel to splash.

We went on to complete our mission and deployment, a better and slightly less foolish detachment. Upon return to port, news of our success made its way along the circuits, and we were praised as a "model WESTPAC team." Captains and admirals shook our hands and the three-star bestowed upon the ship and the det the Meritorious Unit Commendation for "unsurpassed excellence" and "performing exceptional feats."

We were heroes. Perhaps we did do well; perhaps we only thought we were paying attention. I have since wondered how fine the line is between excellence and poor judgment. But for those who haven't been there yet, chart your course well before you take your crew out on the tip of the sword. ◀

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Experience isn't the best teacher if you can't use it again.

Ace L.



**The safest distance
between two points
is sometimes a round line.**

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